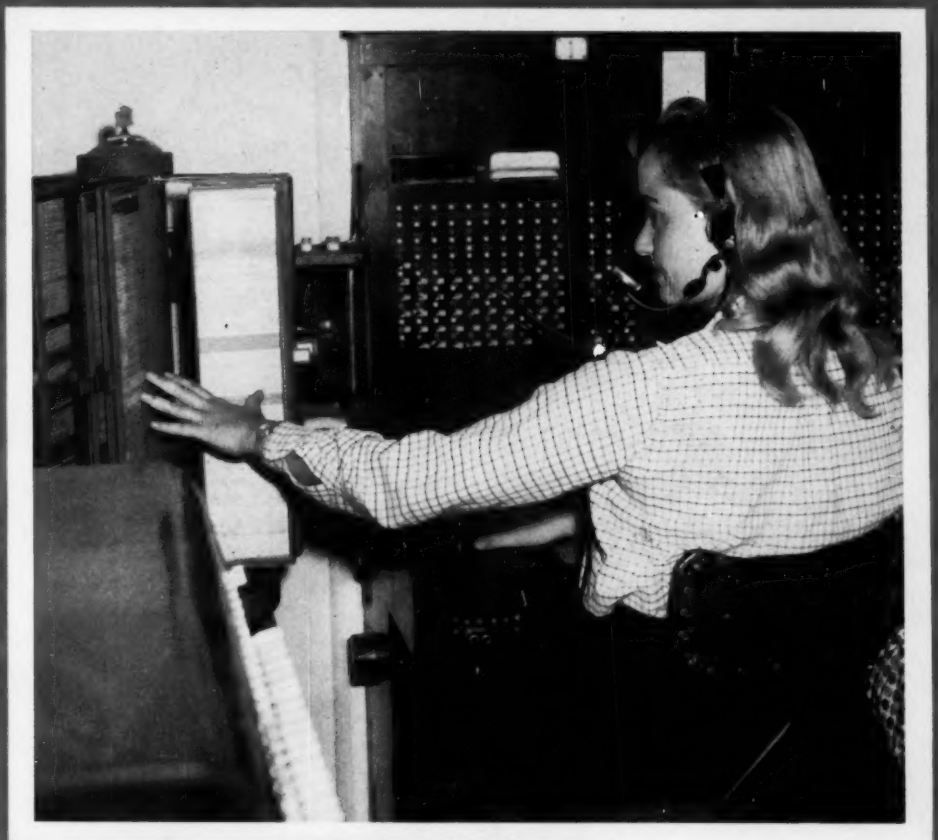
NOVEMBER 7, 1959
VOL. 157 — NO. 19

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
SINCE 1901



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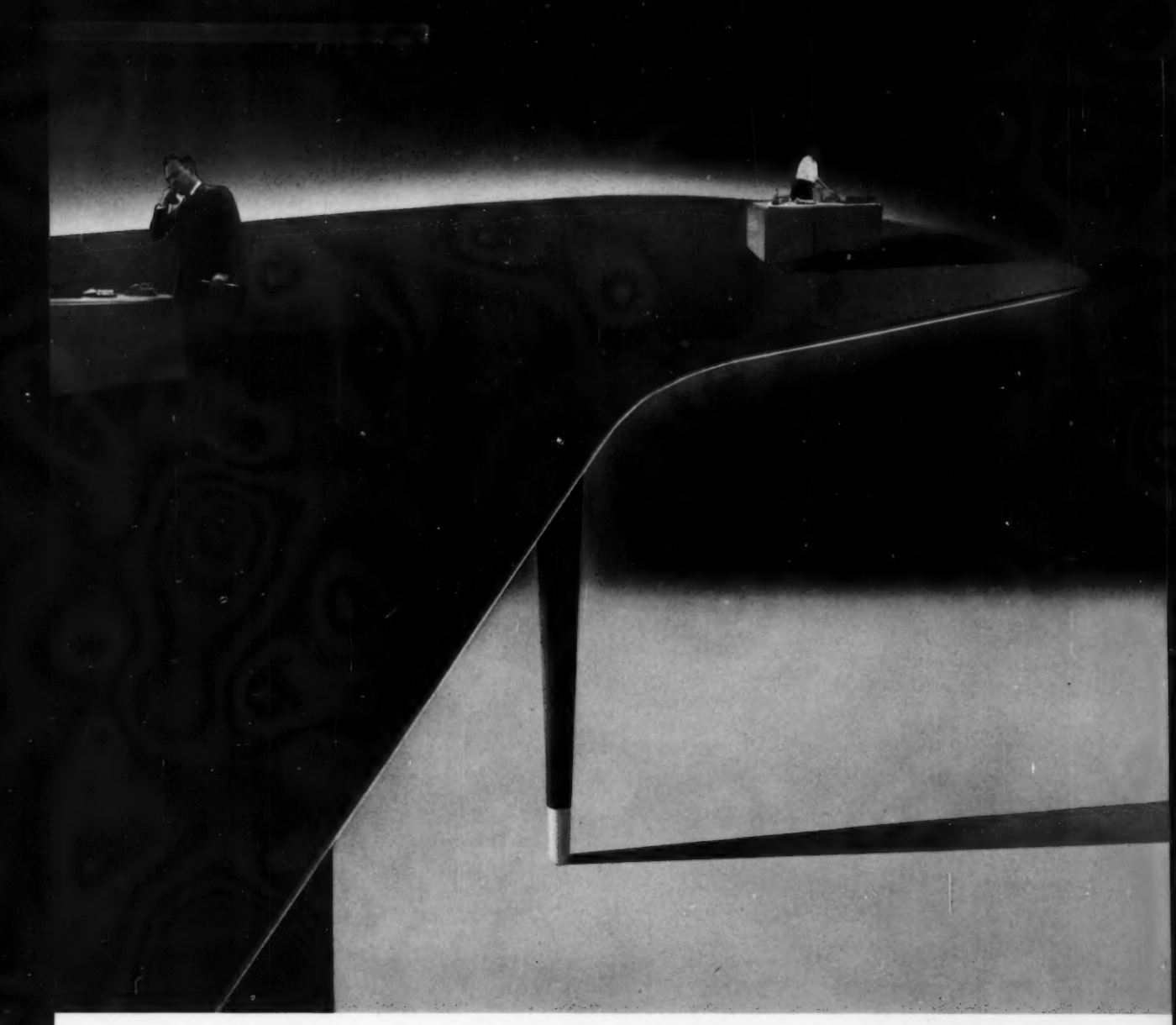
Guaranteed Circulation This Issue
13,377 of Which 12,830 Is Paid

TELEPHONY'S COVER GIRL MAKES GOOD

Chief operator of Au Sable Valley Telephone Co., Keesville, N. Y., is Sally Ann Joy, only 19, called loyal and dependable by manager George S. Beckwith. Her photo was also on March 9, 1958 cover. For her "getting there" effort, see photo, page 63.

MANAGEMENT • PLANT • TRAFFIC • COMMERCIAL • LEGAL • ACCOUNTING

Two-way "Best-Seller"...



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Here is a versatile instrument specially designed to meet your commercial subscribers' needs for two-line *or* three-line service.

Our "1573-W," as illustrated, is the only *modern* "500" type telephone offering three trunk lines with *hold* feature on *each line*. Many of your commercial customers need this type of service.

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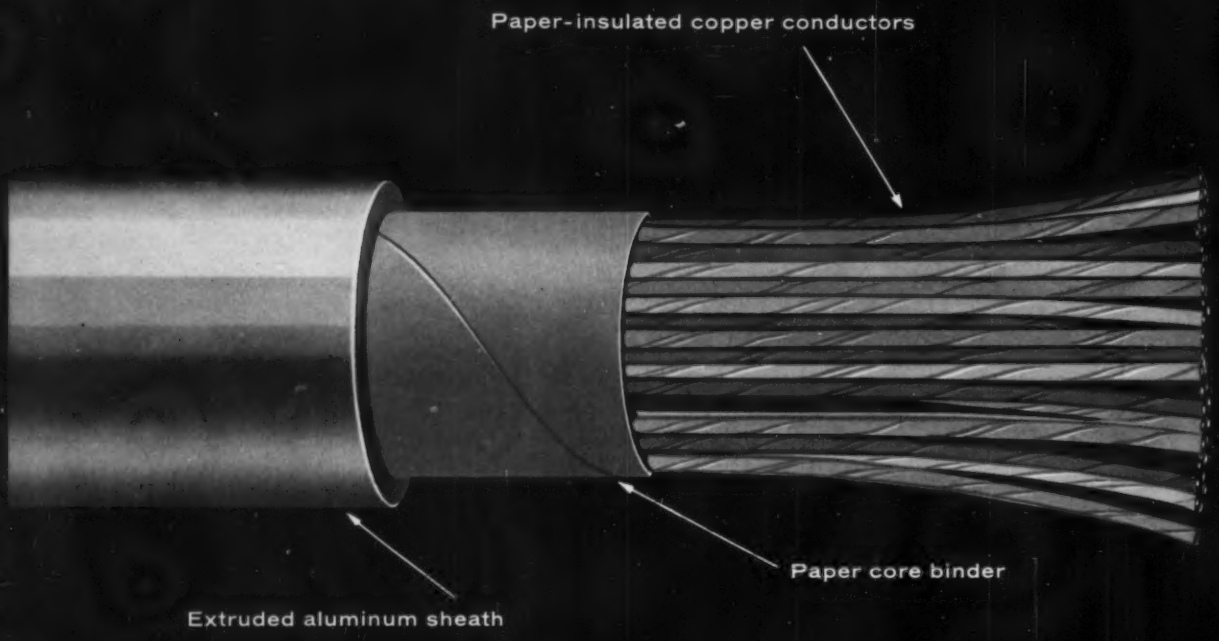

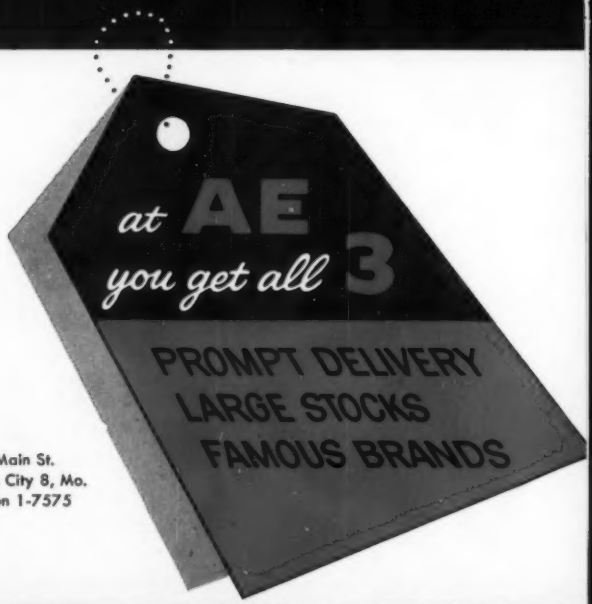

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BROAD TEMPERATURE RANGE! Aluminum is immune to extreme hot or cold weather.

HIGH VIBRATION RESISTANCE! Aluminum gives high resistance to vibration fatigue. This is ideal for aerial installations, especially when supported by structures that transmit vibration.

Extruded aluminum sheath telephone cable is available from AE in a wide range of constructions. For installations in seacoast locations or in industrial atmospheres, a special polyethylene jacket can be supplied for protection against corrosion. Order from your AE sales representative. And remember—At AE, you get all 3!

AUTOMATIC ELECTRIC

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GENERAL SYSTEM

FLASHES AND PLUGS

IDEA FOR FILTERING. The BEK *Beacon*, subscriber publication of the BEK Telephone Mutual Aid Corp., Steele, N. D., printed the following adaptation of a news release prepared by the Employers Mutuals of Wausau:

"A man stands in a home basement, cigarette hanging from his mouth, a tattoo on the back of one hand. He's the rugged type. Looks like he should be stopping a stampede or wrestling alligators. Instead, he is fooling around with the telephone wiring, TV leads, and electrical wiring.

" 'Hello there. Do you work for the telephone company?'

" 'Naw, I'm a truck driver.'

" 'Hmmm—trucks and wires. That's an unusual combination.'

" 'I don't figger it is.'

" 'Well, here's a man who thinks for himself. What's the smoke?'

" 'Uh, let's see.' (Fumbles in shirt pocket.)

" 'No, I mean the wire smoking there—and sizzling.'

" 'Oh, that. Hundred-ten volts I guess. Don't know much about 'lectricity. Bought a couple old phones and made an intercom outfit. Just tinkering around. Lights keep blinkin' on and off and phones don't work. Tryin' to figger what's wrong.'

" 'Hmm, who's your favorite undertaker?'

" 'Oh, Rigger & Mortice, I guess. Nice firm.'

" 'Would you advise all amateur telephone installers to consider Rigger & Mortice?'

" 'Well I figger all amateur installers ought to think for themselves.'

"Most men who think for themselves, who do wiring for themselves, who climb roofs and poles for themselves, prefer Rigger & Mortice. They have the thinking man's type of service, and they've got a handy fliptop casket, too.

"So remember Rigger & Mortice. But, better yet, call in an expert for your telephone problems. For additional telephone service call the office here in Steele, GRidley 5-2361. Whenever possible, service problems should be reported to 'repair service.' To do this, you dial '0' for operator and ask her for repair service, then report the trouble to them."

•

FINDERS WEEPERS. The most sarcastic husband is the one whose wife said to him: "Look at this darling hat I found downtown."

"That's good news," he answered. "I'm sure you would never have *bought* it."

CHANGE OF ADDRESS

Please notify your local postmaster and the Circulation Dept. of TELEPHONY of change of address. Change cannot be made without the old as well as the new address. Allow three weeks for change of address to become effective.

Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY
Since 1901

November 7, 1959

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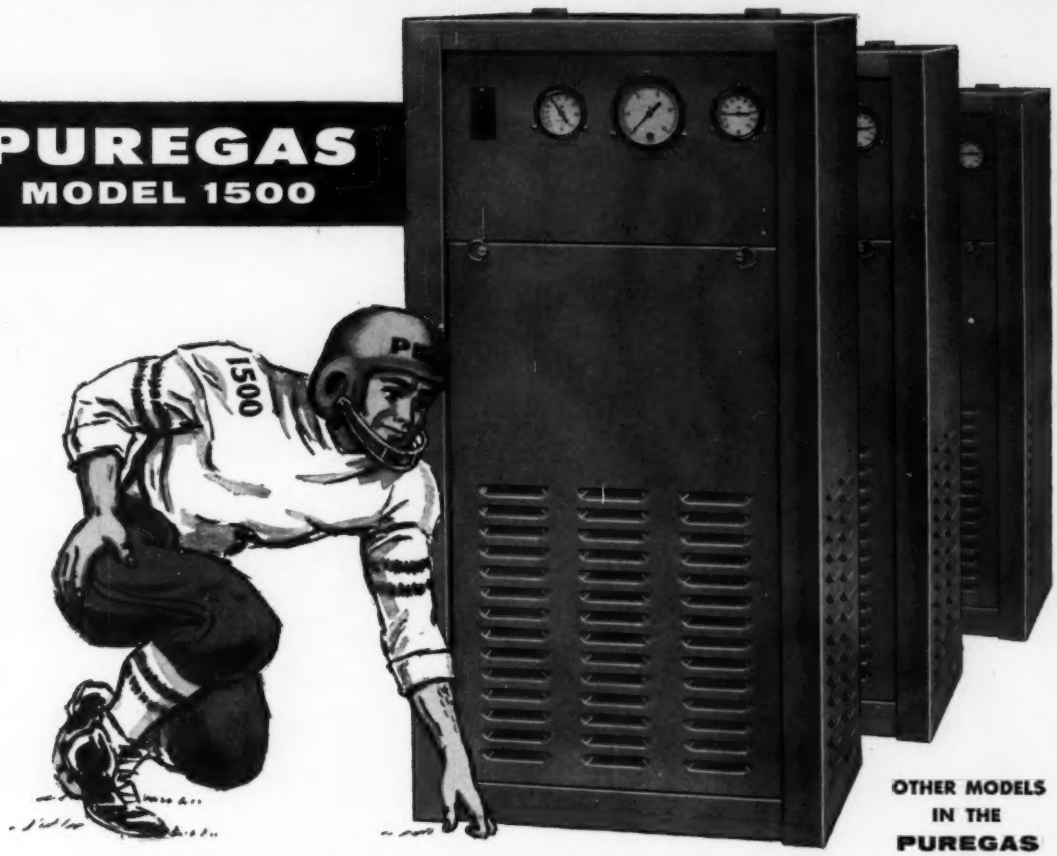

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With the new No. 750 - 1500 and 5000 models, PUREGAS equipment can now be progressively planned into any size improvement budget. Naturally, wherever PUREGAS goes to work guarding and protecting cables from moisture; service improves, maintenance costs decline and greater profits are reflected.

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Interior view of mobile teleprinter center

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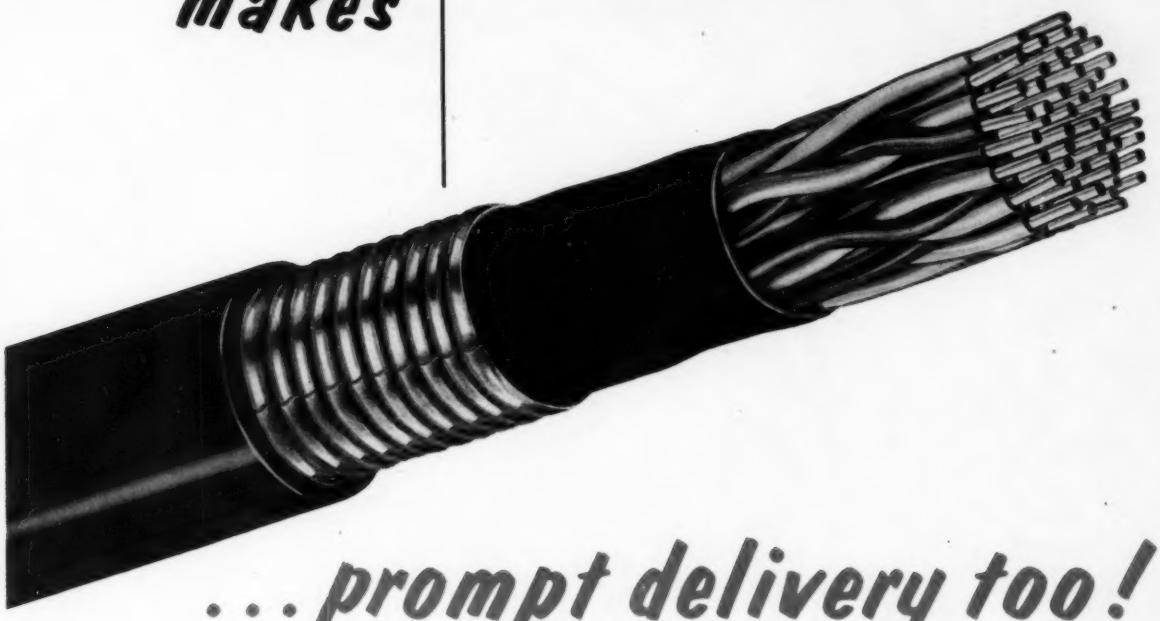

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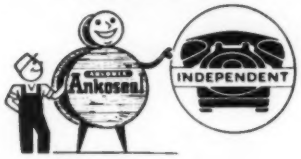

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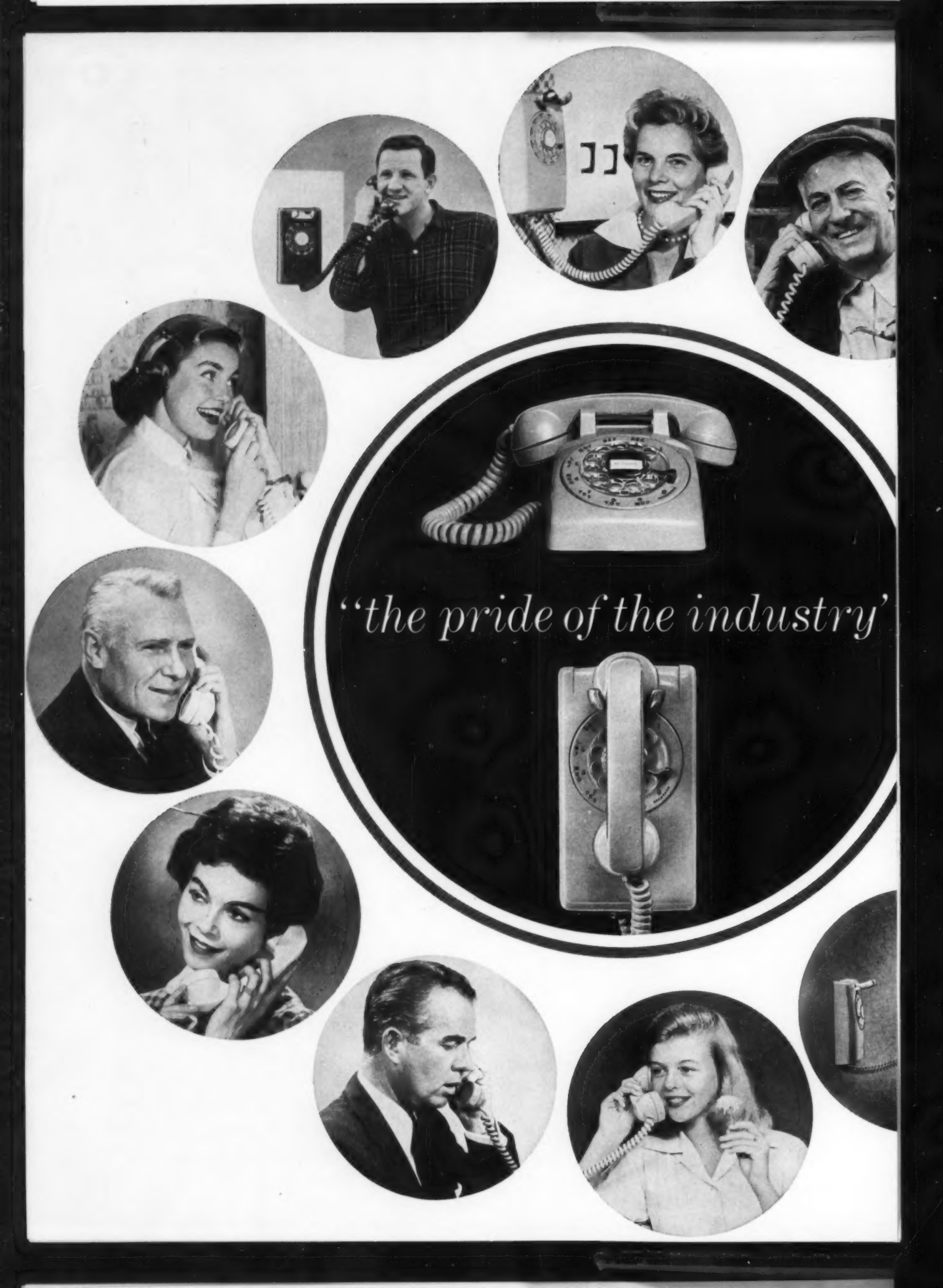
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*OPALON: REG. U.S. PAT. OFF.

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any distance

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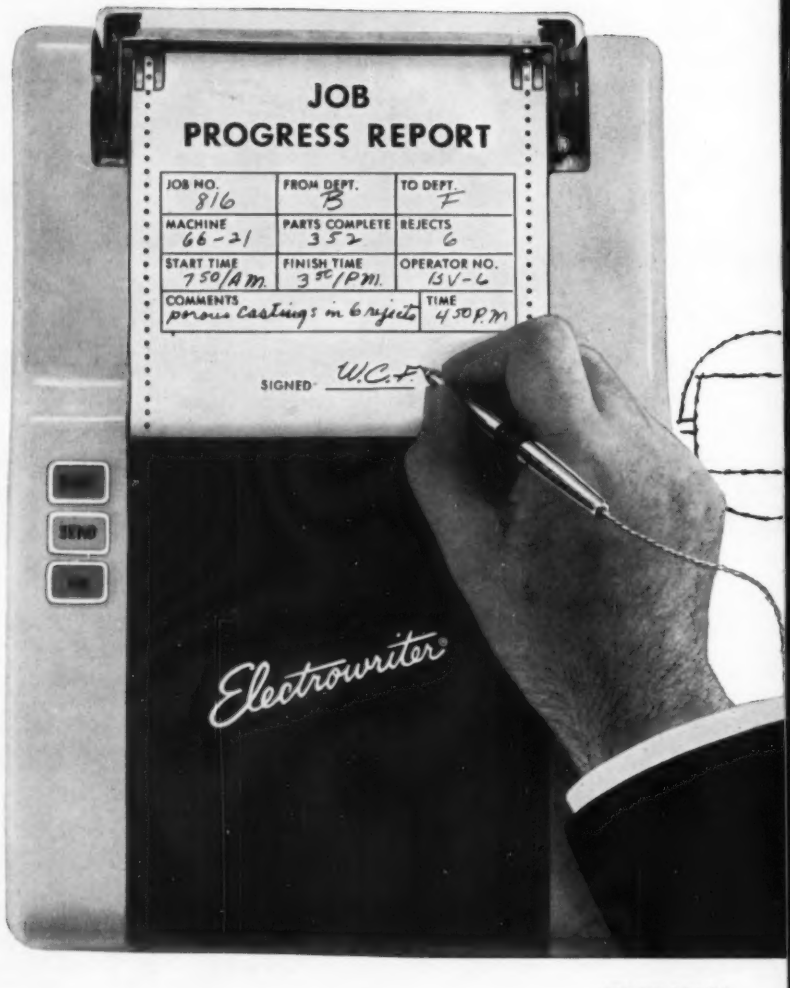

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BY COMPTOMETER

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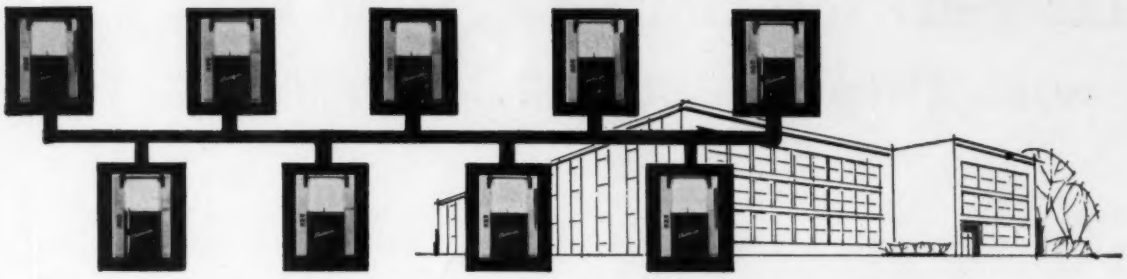
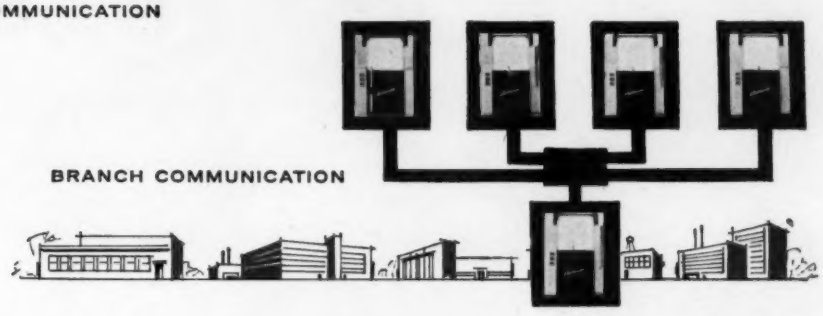


INTER-OFFICE COMMUNICATION



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Electrowriter instruments are "writing telephones", transmitting written messages or sketches over regular phone circuits.

You write with a pen on **paper** as on any note pad, and as you move your pen the remote receiver or receivers instantaneously and faithfully reproduce the copy **as you write it.** Any number of Electrowriter instruments, in any desired combination, any distance apart, can be interconnected. No extraneous power supplies are required. The instruments are self-contained and fully transistorized.

Electrowriter instruments can be attached to the telephone system normally used by plants and offices, permitting alternate message and voice service. Messages between Electrowriter stations will pass through the switchboard in the same manner as telephone calls. Electrowriter "leave word" service is available. When you call a "leave word" station, the Electrowriter Receiver is automatically connected to the line, and you can write any number of messages to the unattended station.

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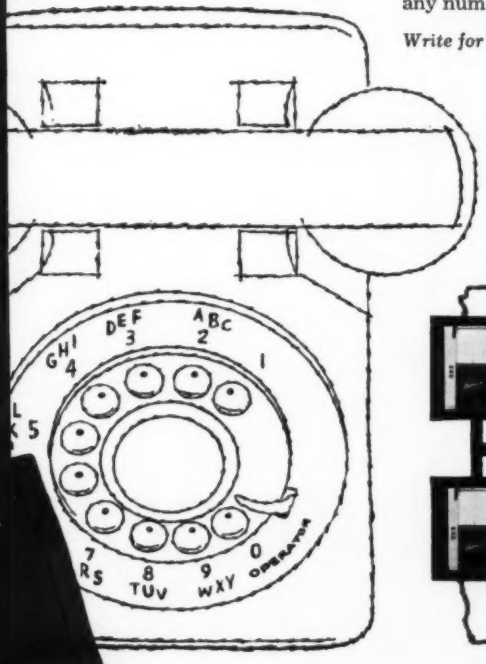

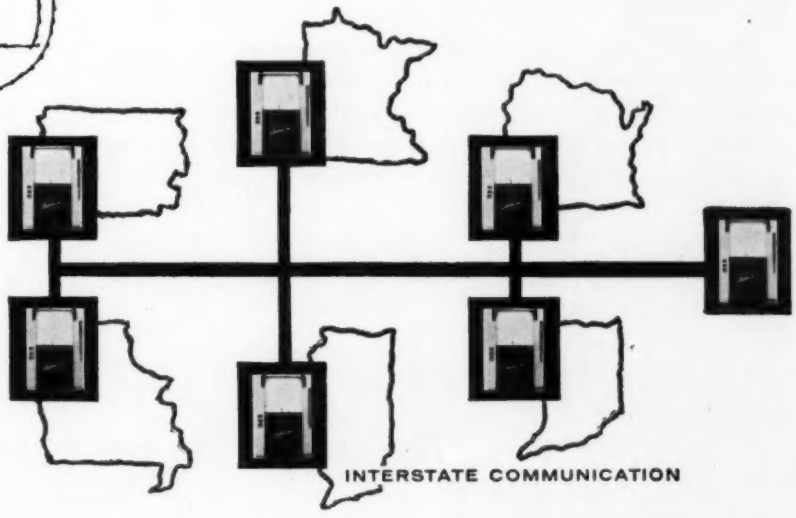

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NEW COLOR-CODED HANDLES

This "visual aid" to better accuracy is a big help to busy operators—excellent for trainees, too. These new handles in color—green for start, red for finish, can be installed in minutes.

NEW SETBACK HANDLE

Now you can use ANY SIZE toll ticket—in operated position handle cannot damage toll ticket. This new feature permits Calculagraph to be used with any card system.

NEW 60-MINUTE DIAL

Busy operators can now handle more calls more efficiently because there's no need to depend on memory or manual computations on long conversations. Assures you, too, of all charges due on every call.

Check your own switchboard now. If you don't have all these Calculagraph improvements, it's time to modernize and incorporate these benefits into your toll timing system.

Your busy operators will like these easier-to-use color-coded handles; the 60-minute dial will eliminate possible human errors in recording long conversations, saving you "lost-time" dollars; and, you will like the flexibility in card sizes permitted by the set back handle. They all add up to faster, easier, more accurate toll time recording.

Call your Calculagraph distributor today. He'll be glad to discuss your modernization plans with you.

FOR LONG-TIME CALCULAGRAPH USERS ONLY

If you are now using the old "round-type" Calculagraphs, you can easily convert to the rectangular Model 33 (shown here) with the convenient adapter plate that requires just a few minutes to install.

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MANUFACTURERS OF ELAPSED TIME RECORDERS FOR OVER 65 YEARS

IN THE NATION'S CAPITAL

BY FRANCIS X. WELCH, WASHINGTON EDITOR
AND EDITOR, PUBLIC UTILITIES FORTNIGHTLY

Post office considering machine to transmit facsimile information from coast to coast. REA telephone advisory committee . . . REA celebrates 10th anniversary of telephone loan program in Washington.

LAST WEEK in the Nation's Capital the National Association of Postmasters held their annual convention. Ordinarily the postmasters and postmistresses are mostly preoccupied with new postal buildings, appropriations, compensation, mail classification, and other such routine matters. But this year the Post Office Department here in Washington had a real tidbit for speculation and conversation. In a word, the Post Office Department let it be known unofficially that it was seriously considering an experimental machine to transmit facsimile information from coast to coast.

This facsimile instrument can take an open letter and transmit it to a receiving machine across the country in a flash. The device has the potential of reducing the time it takes to send and deliver first-class letter mail and other material from days and weeks to minutes and hours. Those working on the device believe it could be used widely within five years.

Two of the prototype machines are in operation, one in the Los Angeles post office and one in postal headquarters in Washington. Both handwritten and typewritten messages and reports are sent back and forth between the two offices in seconds and at a cost which eventually would be less than the seven-cent air mail rate.

Officials of the Post Office Department refused comment on the development. One of the officials said, however "that's under wraps. We are forbidden to talk about it. Too many people and contracting firms would get alarmed over it if we did." Postmaster General Summerfield alluded to fantastic developments ahead when he told the postmasters:

"I am not given to stargazing nor am I much of an unrealistic dreamer but there are some things in the future that will amaze you. . . . The next step in mail service will be as revolutionary and as progressive as anything yet achieved.

"The brilliant minds of our fine staff of engineers, augmented by those of private industry, are on the threshold of even more efficient methods of moving our vast volume of letters in less expensive ways."

Deputy Postmaster General John McKibben predicted to the 4,000 delegates that future postal service would be as different as night is from day. Postmaster General Summerfield was asked later for details of what he foresees, but he shook his head and answered that there were some things he could not talk about.

Other sources explained, however, that many large and powerful business concerns had made strenuous objections to the White House and to congressional members over the interest and participation of the Post Office Department in the development. Some other person acquainted with the project said: "It doesn't take much of an imagination to figure out what the new and rapid communications system might do to the telegraph, telephone, and other industries, not to mention airlines, railroads, ships, and other mail transport carriers."

As a result of these protests, the informant said, a conference was held at the White House in August when it was decided to keep the development under cover until "the potential damages" to business concerns "could be assessed." Such a study, has since been undertaken. Some business interests are reported to have threatened to try to persuade Congress to deny the use of additional funds to continue the project.

Those who have seen the machine in operation say a handwritten letter can be fed into the equipment and a facsimile of it will appear simultaneously on the receiving device. The machine can handle three long letters a second now and their consumption potential has not been reached. The process is similar to that used to transmit newspaper photographs by wire, plus an adaptation of the principle used to send and receive television.

At first, Post Office Department officials rejected the proposal because they agreed that the sanctity of the mails must be preserved at all costs. They concluded that the American public would not stand for the exposure of their personal letters to postal employes. But now the facsimile machine's engineers have developed a device on the receiving machine which will fold, place the letter in an envelope, seal and address it. Except that it will be on different paper, the transmitted letter will be identical with the handwritten original.

Also, the machine will destroy the original letter after it is transmitted. These new and recent improvements, it

is explained, are supposed to protect the sanctity of the mails and they have heightened the interest of public officials in the far-reaching possibilities of the communications project.

President Eisenhower is reported to have expressed "amazement and pleasure" at the speed and quality of the facsimile mail system. It was learned that he sent a message several weeks ago to a friend in Los Angeles on the experimental machine which is being operated in secret on the first floor of the Benjamin Franklin Post Office on Pennsylvania Avenue in Washington (which also houses the FCC, by the way).

The President wrote his note in longhand. Within a few minutes he had an answer to it, also in longhand and written by his friend 2,400 miles away. The Californian, of course, was standing by at the Los Angeles machine, the only other one in the postal service, to get and answer the note.

Imaginations were working overtime among the assembled postmasters as to the far-reaching effects such a mail system could have on the postal service, its 550,000 employes, and the nation's economy.

Facsimile has its skeptics. But in this case facsimile has proved to be a speedy and practical method of communication in newspaper and other businesses.

Western Union's Facsimile

Plans for making intercity public facsimile service available to the general public across the nation were announced by Western Union in Washington on Oct. 26. Rates and regulations for the new service, to become effective on Dec. 1, were filed with the Federal Communications Commission by Western Union. The service, to be initially offered between Washington, New York, Chicago, Los Angeles, and San Francisco, will provide for the transmission of full-page correspondence, letter-size documents, drawings, and other recorded data coast to coast. It will be available to the general public and commercial users in the five cities during regular weekday business hours (9 a.m. to 5 p.m., local time).

Original line drawings, advertising layouts, sketches, charts, graphic matter (excluding photographs), legal or financial documents, where exact reproduction and signatures are important, can be transmitted as a single page or in sections up to 7½ by 9½ inches in size. In addition, lengthy messages, up to approximately 600 words on a single page, either typed or handwritten, will be transmitted at relatively low cost. The service is charged for in accordance with the units of space—7½ inches in width and 1 inch in depth—which the material to be transmitted wholly or partially occupies. Charges for transmission of a minimum area of material 7½ by 4 inches will be $2.00 between New York and Washington, and $4.00 from New York or Washington to Los Angeles or San Francisco.

The charge for additional vertical inches will range from 35 cents to 65 cents. For example, the rate between New York and Chicago for 7½ by 4 inches is $2.40, and 40 cents more would be added if the material is 7½ by 5 inches. The material to be transmitted need merely be typed, written, or drawn on a sheet of white paper not exceeding standard letter size. It will

(Continued on page 64)

REA Approves Three Loans

Three telephone loans were approved during the week of Oct. 19 by the Rural Electrification Administration as follows:

Cherokee Telephone Co., Colbert, Okla.; $751,000; Oct. 19.

These funds will aid in enabling the new borrower to furnish initial service to 704 subscribers and to improve service for 586 subscribers. The existing subscribers now receive magneto service from the following companies: The Home Telephone Co., Calera; the Colbert Telephone Co.; the Bokchito Telephone Co.; and the Peoples Telephone Co., Yarnaby. The borrower has recently acquired the Home company and intends to acquire the others.

Construction plans of the company include new central offices at Achille, Bokchito, Calera, Colbert and Yuba. Practically all of the system will consist of buried cable.

William O. Young is both president and manager of the Cherokee company.

●

Gold Leaf Telephone Co., Moultrie, Ga.; $1,685,000; Oct. 23.

The new borrower, a subsidiary of the Consolidated Telephone Co., Moultrie, was incorporated in October, 1958 to acquire, rehabilitate and expand eight telephone exchanges now owned and operated by Consolidated. They are: Boston, Coolidge, Hahira, Lakeland, Meigs, Morven, Pavo, and Ray City. The exchanges now provide dial and common battery service to 1,562 subscribers.

The borrower plans to provide initial service to 2,350 subscribers, and improve service for the existing ones. Dial central office buildings will be leased for each of the eight exchanges. Headquarters of the Gold Leaf company will be located at Moultrie.

E. E. Kirk is president of the Gold Leaf company and James L. Kirk II is manager.

●

Midstate Telephone Co., Kimball, S. D.; $359,000; Oct. 23.

These funds will help the borrower to improve service for 318 subscribers and to furnish initial service to 74 subscribers.

The subscribers who will receive improved service are now served through the magneto facilities of the Delmont Telephone Co. and four small farmer-owned lines. The borrower proposes to acquire the Delmont company and rehabilitate it. In addition the farmer-owned switcher companies have agreed to abandon their lines and take service with the borrower.

A new dial central office will replace present facilities at Delmont. Of the 74 subscribers who will receive initial service, 42 are located in the Ft. Thompson-Big Bend area. They will be served from the borrower's existing Gann Valley exchange.

REA loans approved to this borrower now total $1,560,000 providing for new and improved service to 2,106 subscribers. Six of the proposed seven exchanges of the system are now furnishing dial service to approximately 1,360 subscribers.

H. D. Brown is president and Reynald C. Stenman is manager of the Midstate company.

Even Count Polyethylene Insulated Cable

By F. W. HORN*

EVEN COUNT cable is designed around the concept of 25-pair color groups which in the larger cables add up to 100-pair multiples. Cables of various sizes may be spliced together without losing the identity or count of any pair. Also a simple record keeping and assignment system is made possible. This scheme fulfills our idea of everything a color scheme might be expected to accomplish.

The purpose of this paper is to follow the evolution of even count cable, the conditions that paved the way for its introduction, the development problems involved and last, but by far not the least, the many advantages of the even count system.

In the early days, paper was used as insulation and later pulp insulation was developed. A few basic colors were employed primarily to distinguish between the two wires of a pair. Groups of pairs or units consisted of as many as 50- or 100-pairs as shown in *Fig. 1.*

The pairs in a group were all identical in appearance, therefore, a tracer pair was added to permit ready identification and to provide a signaling circuit during the splicing operation. Units consisted of red-white, green-white, or blue-white pairs and were identified by colored cotton unit binders.

Extra Pairs Needed

When the cable industry was in its infancy around the turn of the century, it was found that a certain number of pairs failed during the manufacturing and installation operations.

Based on economic considerations, rather than repair such defects, extra pairs were included in a cable to allow for the probable defective circuits. From the beginning, the thinking was to have usable pairs in multiples of 100 and to realize this, an extra pair for each 100 or fraction thereof provided the necessary factor of safety. In the early days of cable manufacture, it is doubtful if there were many cables having more than the round 100 count of working pairs.

As manufacturing techniques improved, there were more and more cases where the spare pairs were usable. Good pairs beyond the even hundred were, of course, used and this developed into an uneven numbering system for both the cables and central office frames.

To illustrate the uneven cable count, in a large cable the successive groups had pairs 1-101, 102-202, 203-303, 304-404, etc. However, since all pairs in the group looked alike and had no identity except that assigned to them in the particular installation, the uneven count was a perfectly workable system.

Random Splicing

Since all pairs looked alike at a splice, random splicing was almost automatic. This was fortunate as ran-

*Mr. Horn is with Bell Telephone Laboratories, Inc., of New York City and he presented this address at the Signal Corps Symposium on commercial wires and cables.

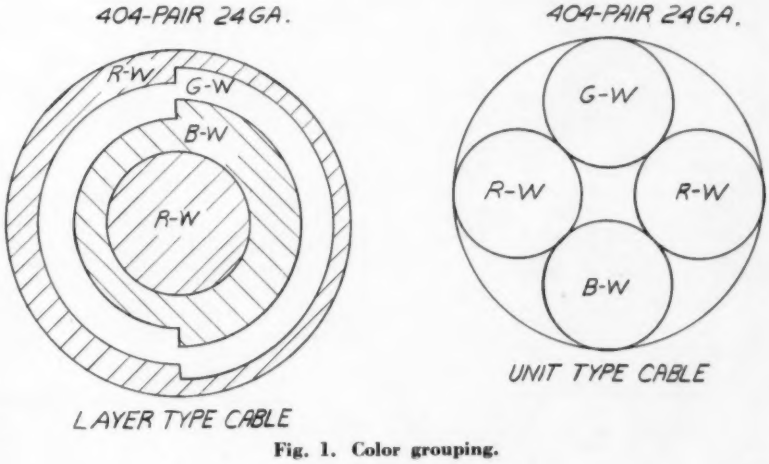

Fig. 1. Color grouping.

dom splicing is a definite advantage in keeping pair-to-pair capacitance unbalance and crosstalk to a low value.

Until the advent of polyethylene insulation, cable systems had to be moisture tight because of the hygroscopic properties of paper or pulp. With an hermetically sealed system, entering a cable was a fairly time consuming process as was the restoration of the sheath integrity after the work had been performed.

For this reason, a pre-wired system was used. Since it was not known exactly where a cable pair would be required to meet subscriber service, each pair was brought out at several locations and terminated on binding posts. Sixteen pairs was a common size and this meant that 16 cable pairs would be permanently wired to each terminal. The same pairs would appear in three or four terminals. With such a system, it was understood that normally a majority of pair appearances would never be utilized.

Since cables were not color coded, test tone methods of identification of pairs had to be used. The test tone had to be applied at a point where the identity of the pair was known. A sharp probe was used to penetrate the insulation to detect the tone on the desired pair.

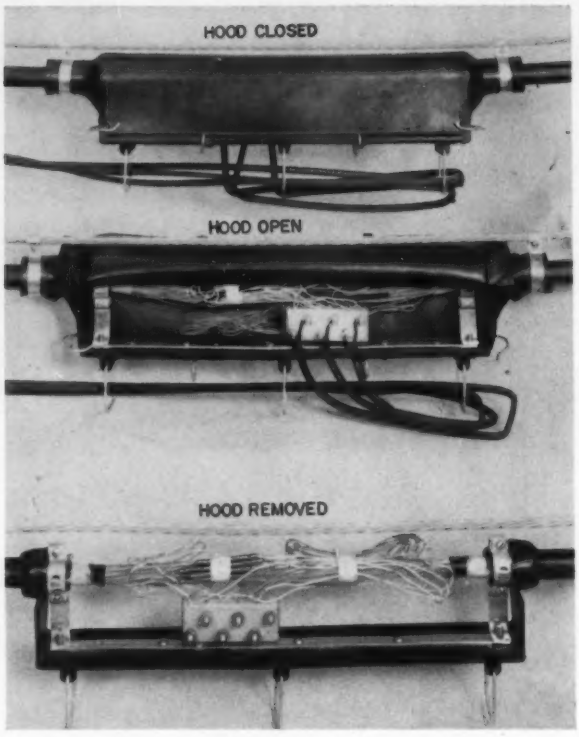

Fig. 2. Ready access terminal.

Polyethylene Insulated Cable

With the advent of polyethylene insulated cable, the basic conditions were changed. Polyethylene is not appreciably affected by moisture and it is, therefore, not essential to provide a gas-tight system.

Based on this advantage, the ready access type terminal was developed. (See *Fig. 2.*) With this terminal, a snap-on neoprene hood is used to cover the sheath opening. Terminals are provided in groups of six but only one pair need be connected at any time. Pre-wired plant is no longer necessary as the workman can now terminate cable pairs on a subscriber requirement basis.

With the polyethylene insulated conductors, old methods of probing with a sharp instrument through the insulation for identification purposes could no longer be tolerated because this would destroy the integrity of the insulation. Tone methods not requiring penetration of the insulation were developed. This system still required assistance at some point where identification is known.

Looking back, it can be seen that these conditions set the stage for completely color-coded cable, spliced color to color, so that identification could be made at any point throughout the entire system. To obtain the maximum economic advantage offered by the ready access terminal, absolute identification was necessary.

Full Color Coding

The first fully color coded scheme was based on identifying a maximum group of 51 pairs. This required 11 colors as the number of pairs identifiable with "N" colors is $N(N-1)/2$.

The seven colors available at the time were blue, green, brown, slate, white, red and black. Four suitable colors had to be developed: orange, yellow, violet and gold.

Incidentally, previous schemes had made use of natural polyethylene as a color but on 24- and 26-gauge, the copper wire showed through making identification difficult if not impossible. The scheme of identifying 51 pairs was used by the Bell System for approximately three years.

It was, however, not possible to keep the same color for the tip or ring in all pairs, as indicated in *Fig. 3.*

Also, the color code combinations were not easily memorized. Inside wiring cable uses a color scheme which is simple, consistent and easy to memorize.

Here blue, orange, green, brown or slate is used for one wire of a pair, and white, red, black, yellow or violet for the mate. The plan was to adopt this to the 51-pair color scheme by using the basic colors for the first 25 pairs, then obtaining the second 25 pairs by staining the mate wires as illustrated in *Fig. 4.* Here the gold would have to be retained for the 51st pair. Polyethylene, however, is difficult to ink. Fortunately another solution was arrived at which did not require the use of a stain.

The break-through actually came as a

Typical Color Identification System for Uneven Count Cable

Pair No.	*Color of Insulation* *Ring*	*Tip*
1	Blue	Red
2	Orange	Red
3	Green	Red
4	Brown	Red
5	Slate	Red
42	Red	Yellow
43	Red	Black
44	Red	Gold
45	Red	Violet
46	White	Yellow
47	White	Black
48	White	Gold
49	White	Violet

Colors of Binders

1. Blue	6. Orange-Black
2. Orange	7. Green-Black
3. Brown	8. Brown-Black
4. Slate	9. Slate-Black
5. Blue-Black	10. Blue-White

Fig. 3

result of a machine development by the Western Electric Co. With conventional unit type construction, units are formed in one pass through a stranding machine and are then combined into a cable on a cabling machine.

One-Operation Stranding-Cabler

With conventional equipment, small units result in a production loss. A one-operation stranding-cabler (See *Fig. 5)* was developed which forms pairs into units and units into a completed cable in one operation, thus eliminating the economic penalty. With removal of the economic penalty associated with small units, work was actively carried out to develop a color scheme which would meet all of the field needs without being hampered by manufacturing considerations.

With a fully color coded scheme, an unusable pair would completely upset color to color splicing. Fortunately, the experience with polyethylene insulated cable was excellent and about the only troubles developing after a cable left the factory, were a few cases of open conductors.

The continuity of polyethylene insulation is such that shorts and crosses practically never develop due to handling of the cable. It was, therefore, economic to guarantee all circuits in polyethylene insulated cables, and, thus eliminate the necessity for spare pairs. This was the point at which the even count cable design was born.

With the economic penalty for small units removed, 25-pair groups were feasible. This permitted adoption of the color scheme used for inside wiring cable. The various groups are identified by colored binders using the same sequence as pair colors; that is, blue-white, orange-white, green-white, etc. A pair of a particular color can appear as four different numbers in a group of 100.

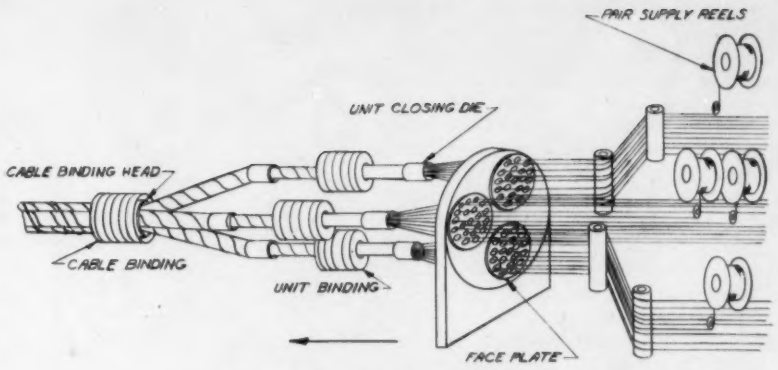

Fig. 5. One operation stranding.

Thus a blue-white pair would be either 1, 26, 51 or 76 depending upon the binder color. In keeping records 100-pair groups are employed. Regardless of the hundreds group to which it was spliced, each pair would keep its basic number. In the old system, every time a cable was spliced to a cable of a different size, the spare pairs would enter into the count and all the pair numbers would change.

No Orphans

Another instance of its simplicity is the manner in which a pair can maintain its color identity from main frame to subscribers' cable regardless of how many transitions are made from a large cable to the smallest.

Every cable has just the right colored pairs to match every other cable and there are no orphans. This was not true of the uneven count system which can be well illustrated by a splice between a cable containing 17-pair units and one containing 51-pair units.

In this case all pairs in one 17-pair unit could be matched perfectly, but since all 17-pair units repeated the same colors, there would be no pairs left in the 51-pair unit to match the remaining pairs. If color identification were to be carried through such a splice, involved records would have to be maintained.

Another advantage of an even count system is the ready adaptation to data processing systems. With five colors for tip and five for ring and the same coloring for the binders, absolute identification can be recorded in four columns on data processing cards and records easily kept of assignments or idle pairs.

The maximum advantage from an even count system was realized by conversion of existing plant to the new numbering system. All of the main frames were renumbered in the even count system and with cables having spare pairs, a scheme was worked out for handling the extra pairs.

Existing records, of course, were renumbered in the same manner. Even with pulp cables having the extra pairs, this is a better assignment system. The use of the even count system will result in large over-all field savings.

Method of Obtaining 50 Pairs Maintaining Tip and Ring Colors

Pairs	*Color of Insulation*		*Band of*
	Ring	*Tip*	*Stain*
1	Blue	White	None
2	Orange	White	None
3	Green	White	None
4	Brown	White	None
5	Slate	White	None
6-10	Repeat Colors	Red	None
11-15	Repeat Colors	Black	None
16-20	Repeat Colors	Yellow	None
21-25	Repeat Colors	Violet	None
26-30	Repeat Colors	White	Black
31-35	Repeat Colors	Red	Black
36-40	Repeat Colors	Black	Orange
41-45	Repeat Colors	Yellow	Black
46-50	Repeat Colors	Violet	Black

Fig. 4

Even Count Design Problems

Designing cables which meet the objectives of the even count system involved many problems. When the number of pairs in a cable can be divided by 25 and this is a number which will provide a geometrically satisfactory cross-section, the problems are at a minimum.

The problems become more difficult when the number of units must lay up with the two 25-pair groups in the center. Experience has shown that, due to the incompressibility of polyethylene insulation, a two unit center cannot be reshaped to efficiently utilize the cir-

cular space without damaging the insulation.

With the old color scheme, every unit started with the number 1 pair which was blue-red. With the even count system, the sequence of pair colors must continue until all 25 types have been used.

When small units are required, therefore, they must be combinable to obtain exactly 25 pairs. Combinations of 8, 8 and 9 and 12 and 13 are satisfactory.

In using 2-8 and 1-9 pair units, the first unit utilizes pair types 1 through 8 and the second, pair types 9 through 16, and the third pair types 17 through 25.

With the 12- and 13-pair units, the 12-pair unit utilizes pair types 1 through 12 and the other unit pairs 13 through 25, as illustrated in *Fig. 6*. Uneven count and even count cables are compared in *Fig. 7*.

Interference Low

From an electrical interference standpoint, different lengths of pair twist are used to keep interference between pairs low. In even count cable a different length of twist is used for each pair in a 25-pair group. Thus, each pair twist is identified by a given color.

It was necessary to develop a set of pair twists which could be used in every possible lay-up without undue electrical interference either at voice or carrier frequencies.

It must also be remembered that in addition to the 8, 9, 12, 13 and 25 pair units, this set of twists also has to be electrically compatible in the small 6,-11- and 16-pair cables. This problem is illustrated by the diagram of inter-pair relationships shown in *Fig. 8*.

The choice of these twist lengths was restricted between the maximum and minimum lengths which could be tolerated. If too long a twist length is used, the wire and mate may become separated during splicing operations. This is time consuming to straighten out. At the low end, of course, output on the twisting machine is greatly reduced and if carried even further, the capacitance of the pair would be high. Fine gauges aggravate the situation and it was necessary to devise three different sets of twists. Number 24 and number 26 gauge, however, do not necessitate separate twist systems.

Larger Units

Another physical design feature which required considerable development effort was in the need for units larger than the 25-pair color group.

The solution to this problem also solved the difficulty mentioned earlier

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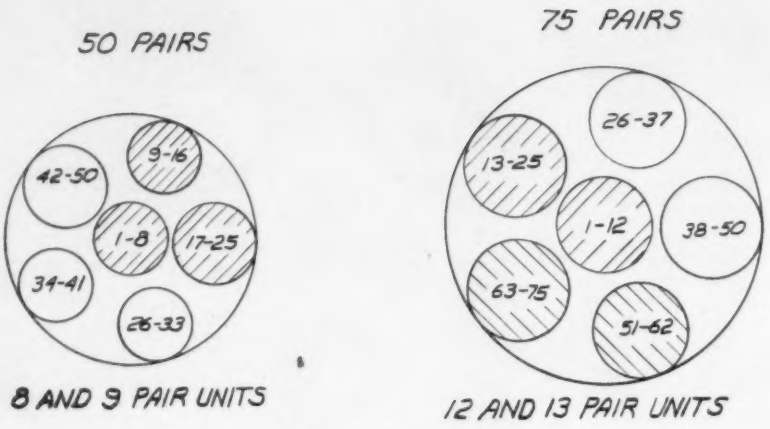


Fig. 6. Typical even count cables.

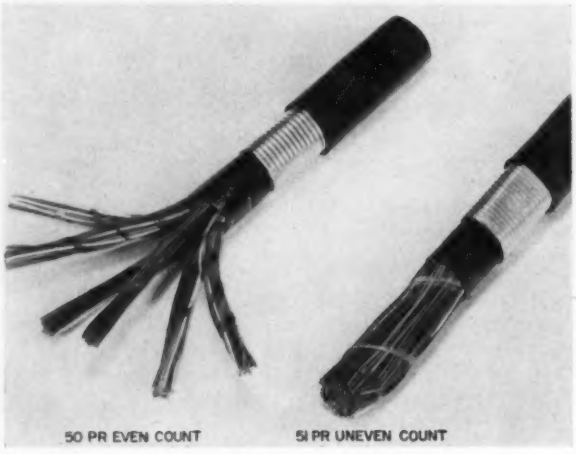
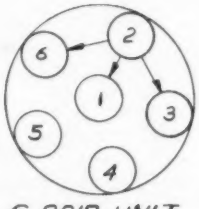
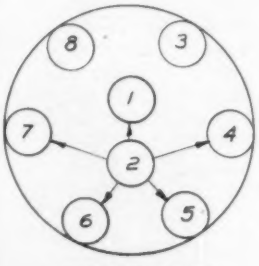


Fig. 7. Comparison of uneven and even count cables.





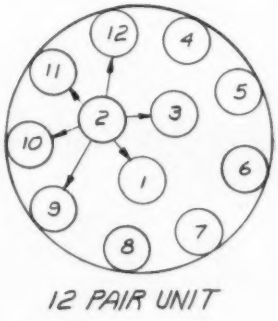


Fig. 8. Interpair relationships in various size units.

Pictured are Nevada Telephone Association officers: Mrs. Evelyn M. Gerow of Yerington, vice president; Mike Burns of Mesquite, secretary-treasurer; John W. Christian Jr. of Pioche, president; as well as Retiring Director Gilbert Thomas of Las Vegas. Not shown are 1960 directors Paul R. Bond of Reno and Frank Dressler Sr. of Las Vegas.

Nevadans Hold 1st Convention

By Dianne P. Drucker

GOV. GRANT Sawyer, speaking over a direct telephone line from Portland, Ore. welcomed the Nevada Telephone Association's first convention to his home town, Elko, on Sept. 23. One hundred and fifty members were present at the meeting which lasted through Sept. 25. Mike Burns of Mesquite presided.

An emblem, devised and conceived by Mrs. Evelyn Gerow of Yerington, secretary-treasurer, and Paul Bond of Reno, director, was adopted. This insignia is in the shape of a silver dollar and inside the circle are the words:

"Mutual Respect
"Cooperation
"Unity in the Telephone Industry."

Mr. Bond presented the new association with a gavel set he himself had made. The names of charter member companies are engraved on a gold band which encircles the gavel plate. The set is made of woods furnished by telephone companies.

With the gavel, Mr. Bond presented the following legend:

". . . presented . . . in memory of Allye Lawson . . .

"The pine is from a Western Union telegraph line which served the then thriving mining area of Tuscarora in the 1880's. This line was purchased and converted to a telephone line between Elko and Tuscarora in the 1890's by W. T. Smith, an early pioneer and one of the founders of the Elko Telephone Co., predecessor to the California-Pacific Utilities Co. It was the first telephone line in Elko County.

"The redwood is from an early pole line of the Elko County Co.

"The maple is from the first switchboard of Western Electric Co. manufacture installed by an Independent telephone company in Nevada, the Elko County company.

"The oak is from a telephone instrument which quite probably saw service in the Tonopah-Goldfield area during the peak of the gold rush in that area.

"The bell is significant in that it is of the same vintage as the telephone instrument from which the oak was taken."

Speaking on the subject, "The Present and Future of TELEPHONY," Hugh A. Barnhart, immediate past president of USITA, stressed that telephone people must pay attention to a woman's point of view.

He said: "The telephone of the near future will be smaller, lighter, more pleasing to the eye, and yet, at the same time, more efficient than the telephones we have today."

He also described, as part of what the future holds, the Bell laboratories wave guide. "This," he stated, "is a hollow copper tube. A pair of them will transmit electrical waves which will make it possible to send through over 400,000 telephone conversations at the same time."

A prediction that a radio-relay satellite will make it possible to telephone any point in the world, and for 20 cents per call, was discussed by Mr. Barnhart as a possibility not to be discounted in the light of the rapid pace of technological advancement in communications.

Turning to the present, he outlined some of the USITA's projects during 1959.

The activities of the Toll Settlement Sub-Committee were cited to show, Mr. Barnhart said, "that the USITA is working constantly in behalf of all Independents and their financial welfare."

As for excise taxes, another national problem facing the USITA, he pointed out that:

"All out repeal will never be accomplished unless the great mass of back-home telephone users who are the voters, tell their congressmen about it. Our job as telephone folks is to educate the public so that everyone will realize that they alone will benefit from such action and that complete repeal will bring them an immediate reduction of 10 per cent off their monthly bills."

The Independent industry, through the efforts of the USITA national advertising program, is becoming known to the public, Mr. Barnhart stated.

This program, he said, "has helped provide expansion capital for our companies, promoted a better atmosphere for more adequate rates for service, helped attract capable personnel, helped build good will and public confidence, and promoted the American system of free enterprise."

In another speech presented, advertising and merchandising-conscious companies were told they should not lose sight of the basic product they have to offer, good transmission. John H. Barrows of Victorville, Cal., speaking on "Observations on Transmission," stressed that good transmission has the unique advantage of selling itself.

The more convenient and pleasant it is for people to talk on the telephone, the more they will want to talk, he said. By the same token, nonusers will be attracted.

"To exploit this self-perpetuating situation," he stated, "we must have, above all, the ability for people to hear and be heard easily and well."

He described tests conducted by the Bell Laboratories to determine how people would react to different grades of transmission.

The evidence, he reported, establishes rather well that a grade of transmission that will be considered good by practically everybody must be very good indeed.

"Not many of our telephone connections provide this grade of transmission," Mr. Barrows stated, "So for the present and for some years in the future, we shall have to direct much of our effort to this problem . . . today's people are more critical than those of a few years ago."

Specifically, he said:

"One of the easiest and simplest ways of attacking this problem is through the telephone instrument itself. In the new sets, sometimes called high efficiency instruments, there are some remarkable features, one of which I particularly want to call to your attention, because these telephones can both improve transmission and save money for you in new basic plant construction.

"These new instruments were designed especially to improve transmission on long loops, right where the need is the greatest. As a by-product, they also permit the use of very small gauge cables in the shorter loops. They are so efficient that signalling considerations become the limiting factor in most applications.

"Another simple approach to better transmission and lower costs may be found in the use of fine gauge cables equipped with loading coils to offset the losses of the small conductors. This type of installation is simple to make; it is practically as trouble free as cable alone and has a long life.

"Some of the biggest savings and some of the best improvements in transmission can be secured through the use of electronic equipment to supplement or augment the basic wire and cable plant.

"Perhaps, the most useful equipment in this category is carrier equipment. It comes in all kinds, sizes ranging from 1,800 channel coaxial cable systems to single channel subscriber line units.

"Some of the more recent developments are in the short haul trunk field where costs have been pared down so low that some of these new systems will prove in on distances of less than 10 miles."

Another speaker on service improvement was Charles C. Kaiser of Lynch Carrier Systems, Inc. The title of his talk was "Conditioning Telephone Plant for Carrier Use."

The Nevadans also heard Frank A. Morris, of Stromberg-Carlson Co., discuss "Alice in Binary Land."

To keep subscribers informed on the reasons for a company's actions, a good public relations program for utilities is necessary, Noel A. Clark, member of the Nevada Public Service Commission, told the convention in his address "Public Relations, Everybody's Job."

Mr. Clark defined public relations as "the business of making sure that the public does have all the facts."

"In the past," he said:

"Public relations has been criticized because some of the people working at it put out information that was not factual. It was designed to serve certain deliberate purposes. It was out and out propaganda—and it bore little relationship to the actual facts.

"I am not talking about this kind of public relations, I am talking about the way you have to live as a state commission or a business, particularly a basic public utility . . . The only basis on which you can live soundly with the public over the long run is to stay with the facts. Any trickiness or fanciness, or coloring, is bound to catch up with you."

Utilities, more than most other businesses, live with the public, Mr. Clark emphasized, saying, "your service to them, depends in a great measure on

(Continued on page 47)

Old acquaintances weren't forgotten in the fellowship at the Nevada convention. Pictured enjoying some food and fun are these two tablesomes.

Modern Office Equipment Solves Telephone Paperwork Problems

*By Robert H. Dengler**

"IMPROVEMENT of paperwork methods and elimination of clerical waste is becoming one of the real business challenges of our time."

This statement was made recently by an engineer of a leading telephone company, who also serves as chairman of his company's clerical operations coordinating committee. He was speaking to members of the Minnesota chapter of the American Institute of Electrical Engineers.

He said, "Systems and procedures specialists agree that in the average organization about 10 per cent of the paperwork being handled is wasted on jobs that never should be performed; close to 20 per cent of paperwork is being dissipated on jobs that could be performed in an easier, faster, and less expensive manner; and the remaining 70 per cent of the paperwork is accomplished at between 60 per cent and 70 per cent efficiency."

These problems exist in many of the 17,000 telephone company offices throughout the country. While the majority of these companies are undergoing a rapid growth in sales and investments, profits are curtailed because time and money are wasted in handling paperwork.

Solutions to these problems of course vary with the organization but certainly include the concerted, coordinated effort of key personnel to reduce paperwork waste which the speaker recommended, as well as the adoption of systems and equipment that can cut manual paperwork to a minimum.

One such system is electric copying, now being widely used in telephone company offices to perform specific communications jobs.

Our company, which produces "Thermo-Fax" brand copying machines, has found through research that the amount of paperwork required to sell, install, service, maintain, modify and expand the increasing number of telephones, lines and automatic equipment can be greatly curtailed by using electric copying machines to make error-free, extra copies.

In just a few years the copying machine has become a vital part of day-to-day office operations. They are being used to make extra copies of letters, charts, reports, memos, and other written, printed or drawn items in just a few seconds.

Most copying machines can be placed conveniently in any office, require no special training to operate, and fall into an economical cost zone.

Here are 10 major ways these machines are being used by telephone company departments to increase efficiency and reduce costs:

Accounting—The two main uses are to make extra copies of monthly bills and toll statements for customers and copies of bill stubs returned by customers with their payments.

Formerly, bill stubs and extra copies of monthly bills and toll statements were typed at great expense.

Copying machines, which make copies in as little as four seconds, have reduced labor and material costs for these two jobs to a fraction of their previous level.

•

Commercial—Copies are made of key system or K plan charts. Information on a chart formerly was transcribed by hand, often taking an hour or more. Now copies of the complete chart are made in seconds, allowing faster service, better customer relations and monetary savings.

A large eastern telephone company reports it saved over $250,000 in labor costs the first year it used copying machines to do this work.

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Directory—Copying machines are used to make copies of:

(1) Several advertising layouts which are presented in brochure form to yellow page advertising space buyers. Copies permit presentation of the brochures to the customers on the salesman's first call. In addition, artists can make better use of their time because they no longer have to make

(Continued on page 46)

The Northwestern Bell Telephone Co. has improved paperwork methods and eliminated clerical waste in its St. Paul, Minn. offices since adopting systems and equipment that have reduced manual paperwork to a minimum. One of the company's time-saving pieces of modern equipment is a "Thermo-Fax" electric copying machine, being operated by Miss Marian Hauck of the engineering department. This machine makes extra copies of letters, charts, reports, memos, and other written, printed or drawn items in a few seconds. (Minnesota Mining & Mfg. Co. photo.)

*Mr. Dengler is Technical Service Manager, Duplicating Products Division, Minnesota Mining & Mfg. Co.

today's Highlights

of finance-taxes-business trends

by Willard F. Stanley

BREATHING SPELL FOR BONDS: The 35 days ending Oct. 26 were a queer "mish-mash" as far as the new-issues market for funded debt was concerned. Action and counter-action of various factors resulted in a net improvement in new offering funded debt yields, with triple "A" rated offerings quoted in the open market somewhat below, and double "A" ratings, something above a 5 per cent yield basis.

The success of the so-called "magic 5s" offering of new 5 per cent approximately five-year bonds by the federal treasury was a potent psychological factor on the upside, although the success of the offering resulted from underpricing the securities; 5 per cent proved a truly "magic" figure in attracting money from the small investor, as witness the substantial withdrawals from savings banks, savings accounts, savings and loan associations and considerable redemption of federal savings bonds.

Continuance of the steel strike also may have been a factor in loosening money rates a bit, with the thought that protracting the strike might slow down the boom and thus reduce demands for money. However, it appears that so far the strike hasn't materially affected expansion plans which still register an estimated 9 per cent increase in expenditures for 1959 over the previous year.

The next few months may witness a sort of muddled marketing time in the bond market, with only moderate net changes. Until the steel strike is favorably resolved, there doesn't appear to be the same probability that existed a month ago for higher funded debt yields over the near term.

The Wall St. Journal tabulation of new issue prices indicated that, at Oct. 23, average bid prices for 10 new utility funded debt issues produced an average yield four decimals (0.04 per cent per annum) below the average yield on these issues on the basis of their original issue prices.

With the present unusually confused picture, adherence to regular schedules for offerings of new funded debt by utilities seems the wisest course.

A statistical study of 115 electric utilities indicates the market value of their common stocks slipped somewhat at Sept. 23, as compared with a month previous, largely in harmony with the general market decline during this period. However, average price-earnings ratio of these stocks still stands at 16.4 at the September

(Continued on page 30)

Mr. Stanley, formerly a utility financial executive, is now president of Corporate Services, Inc. of New York City and is well known as a financial writer. He is a member of the Controllers Institute of America and the New York Society of Security Analysts. He serves on the Finance Management Committee and the Tax Committee of the Controllers Institute (N. Y. Control). His articles are appearing once a month in TELEPHONY.

What major contractors say about CABLEGARD™*

"... lowers installation costs ..."

"We wish to express our satisfaction with Cablegard. It not only lowers installation costs, but greatly increases the physical security of buried telephone plants. We first began using Cablegard a year ago, and have installed it on all our underground telephone jobs since then. We are continuing to find new uses for this product, and feel quite sure that in the near future it will have universal application."

FRANK HORTON, PRESIDENT
FRANK HORTON & COMPANY, LAMAR, MISSOURI

"... far easier (than pipe) to install ..."

"Your Cablegard has proven far easier to install, compared with pipe, for culvert and bridge crossings. We like the idea of eliminating splices and extra pedestals formerly needed for this purpose. Past practice sometimes called for burying cable in the riverbed or running piping on the bottom —which was risky, for ice and floods could ruin such an installation. Cablegard, securely fastened to bridge beams, makes a safe, practical, good-looking job. We highly recommend your product to owners and engineers."

R. J. MULLEN, PRESIDENT
MULLEN CONSTRUCTION CO., INC., APPLETON, WISCONSIN

*PAT. PENDING

EXCLUSIVE...

Butler Cablegard gives the protection of solid-wall pipe or conduit, above or underground. Installs in minutes, with no special skills needed. It's flanged to clamp *around* cable, avoids cost of cutting and splicing. Approved by R. E. A. (see REA Bulletin 344-2) Cablegard will put your plant construction program miles and dollars ahead!

AVAILABLE... from distributors in your area!

GRAYBAR ELECTRIC CO., INC. New York City, N. Y.
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JOSLYN MFG. & SUPPLY CO. Chicago, Ill.
KELLOGG SWITCHBOARD & SUPPLY CO. Chicago, Ill.
LEICH SALES CORPORATION Chicago, Ill.
STROMBERG-CARLSON CO. Chicago, Ill.
LINE MATERIALS INDUSTRIES Milwaukee, Wis.
SUTTLE EQUIPMENT CORP. Lawrenceville, Ill.
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Show Your Complete Line in

with LEICH's PABX Sales Kit

Ever have trouble showing and comparing PABX systems to a prospect? Leich's PABX Sales Kit is an excellent solution. It lets you show a prospect Leich's complete line of PABX's in a matter of minutes.

A practical, easy-to-read chart tells at a glance the capacity, type of attendant's cabinet, switchboard, and other information about each of Leich's PABX systems.

Individual brochures help you do a more complete selling job. These brochures cover Leich's popular 40A PABX, other PABX's with keyset turrets, and PABX's with floor-type cabinets.

Write for Leich's PABX Sales Kit today.

LEICH PABX DIA

for faster, more

TYPE	LINES	LINKS	CITY TRUNKS	TYPE OF ATTENDANT CABINET
40A	40 Not expandable	5	10	See Fig. B. May be used with without turret.
88A	88 Not expandable	9	10	See Fig. B. May be used with without turret.
100A	100 Not expandable	10	10	See Fig. A
100C	100 per bay, expandable	15 per 100 lines	See brochure	See Fig. A
100T	100 per bay, expandable.	15 per 100 lines	See brochure	See Fig. B or C May be used with without turret.

LEICH

Subsidiary of GENERAL TELEPHONE & ELECTRONICS

Minutes

How to Sell Your LEICH PABX Prospects

TELEPHONE SYSTEMS

ficient business communications

SWITCHBOARD UNIT	POWER	TELEPHONE INSTRUMENTS	STANDARD SERVICE FEATURES	OPTIONAL SERVICE FEATURES
Steel cabinet with hinged doors front & back. 72" high, 48" wide, 10" deep. All-relay operation.	Ringing & talking supply contained in switchboard unit. Standby batteries, if required, are mounted externally.	Standard telephone instruments are used on all Leich PABX's. Push-buttons & special wiring not required.	2-digit local dialing, local links not tied up on city trunk calls. Consultation & transfer service. (SEE INDIVIDUAL BROCHURE)	A wide variety of optional service features is available on Leich PABX's. (See individual brochures for specific features.)
Steel cabinet with sliding doors front & back. 88" high, 96" wide, 15" deep. All-relay operation.	Ringing supply contained in switchboard unit. 48 volt battery & charger or battery eliminator are mounted externally.		3-digit local dialing, local links not tied up on city trunk calls. Consultation & transfer service. (SEE INDIVIDUAL BROCHURE)	
Steel cabinet with sliding doors front & back. 88" high, 96" wide, 15" deep. All-relay operation.	Ringing supply contained in switchboard unit. 48 volt battery & charger or battery eliminator are mounted externally.		3-digit local dialing, local links not tied up on city trunk calls. (SEE INDIVIDUAL BROCHURE)	
Steel cabinet with sliding doors front & back. 88" high, 96" wide, 15" deep. Power Bay 87" high, 24" wide. Trunk Bay 87" high, 59½" wide, 15" deep. All-relay operation.	Ringing supply mounted on Power Bay. 48 volt battery & charger or battery eliminator are mounted externally.		3-digit local dialing. (SEE INDIVIDUAL BROCHURE)	
Steel cabinet with sliding doors front & back. 88" high, 96" wide, 15" deep. Power Bay 87" high, 24" wide. Trunk Bay 87" high, 59½" wide, 15" deep. All-relay operation.	Ringing supply mounted on Power Bay. 48 volt battery & charger or battery eliminator are mounted externally.		3-digit local dialing. (SEE INDIVIDUAL BROCHURE)	

ATTENDANT'S CABINETS

LEICH SALES CORPORATION • 427 WEST RANDOLPH STREET • CHICAGO 6, ILLINOIS

PACIFIC COAST: 11401 W. PICO BLVD., LOS ANGELES 64, CAL.
SOUTHWEST: 1227 SLOCUM STREET, DALLAS 7, TEXAS
EAST: 3651 CONNECTICUT AVENUE, YOUNGSTOWN, OHIO
SOUTHEAST: 5126 SOUTH LOIS ST., TAMPA 11, FLORIDA

manufacturers of telephones, switchboards and related apparatus since 1907

date, indicating an average cost of common stock money for these companies of only slightly over 6 per cent, before deducting expenses of sale.

According to financial history, this is an extraordinarily favorable cost for the issuer, making it desirable to dispose of common stock promptly for needs extending considerably into the future. Higher prices might be obtained by waiting if the market turns upward, but this would, to a large extent, be "gilding the lily".

* * * *

"TECHNICAL" RALLY REVIVES STOCKS: As was to be expected after the substantial declines in August and September, October (to the 26th of that month) witnessed a fair recovery in average stock market prices. This recovery was "due" on a "technical" basis, since the market had become oversold. It may, however, also have resulted from the play of several factors, such as, for instance (1) the standing up of the general economy somewhat better than had been anticipated in the face of the continued steel strike, and (2) postponement of President Eisenhower's visit to Russia, tending to take this high-level visiting, and its possible consequences in lower defense spending, off the front pages.

The steel strike has become a "see-sawing" influence, with the market rising on favorable rumors and vice-versa. The New York Times combined 50 stock average registered at Oct. 27 an increase of 8 per cent over the 1958 year end, compared with a 4 per cent increase over that date at Sept. 22. This is equivalent to a rise in this average of about 4 per cent from the earlier to the later date.

Many stocks still remain high in terms of earnings and dividends. Preliminary figures for the third quarter, covering 215 companies, show five out of six improved earnings over the same quarter of 1958, with an average increase of about 20 per cent. This is substantial, but far below the 75 per cent increase experienced in the first quarter of 1959.

It must be remembered, however, that the comparisons are still being made with periods affected to some degree by the late recession. When 1960 figures begin to show improvement over 1959, then hats may logically be tossed in the air. But, at present, the results, although favorable in general, are still too complicated by dates of comparison to be given full value.

Despite their September decline (perhaps because of it) utilities still stand out as the best investment medium combining reasonable safety, maximum income (under present-day standards) and moderate opportunity for appreciation in price. The so-called "space" stocks have largely taken the play away from the electronic equities with prices again seeming to discount not merely the future but the "hereafter".

* * * *

BUSINESS STILL PRETTY GOOD DESPITE STEEL: There was a slight falling off in industrial output in August and a somewhat higher figure is expected for September. The October showing seems bound to make an even less favorable comparison as it is apparent that quantity steel production can't be expected until at least early in November. On the whole, however, despite increasing unemployment, the principal basic factors of the economy,—retail trade, expansion expenditures, consumer spending, national income, etc.—all have been holding up better than was anticipated.

At this writing neither side in the steel strike seems anxious to "give-in" on the intricate problems of management work rules—the real crux of the quarrel. Perhaps they feel that this is a good time for a grand tug of war to decide who is really going to "manage". Union leaders may fear a "give-in" here could be followed by loss of "feather-bedding" rules in other industries. Steel management may think that now that they're "well heeled" financially, it's a good time to "have it out" on this extremely vital point; may also feel that a prolonged strike won't seriously hurt the present boom economy. It's anybody's guess, but the writer leans to the belief that the controversy will still be prolonged, despite invoking Taft-Hartley.

Perhaps the steel strike, coming at this time, isn't altogether an "ill wind". If the boom had continued to accelerate, a "bust" might not be far distant. The steel situation, as a temporary levelling-off factor, may serve to save us from what might have been a serious explosion later.

THE Plant Man's Notebook

BY RAY BLAIN, TECHNICAL EDITORIAL DIRECTOR

IN MAKING TELEPHONE growth forecast studies today in any area, consideration should be given to the number of families in the area who may have a second home that will require a telephone.

We are said to be the land of a second bath and a second car, and it appears that many will soon have a second home. It is claimed that we now have more than one million families who maintain a second home: one in the city or suburbs and the other farther out in the country. Furthermore, it is estimated that 75,000 second houses will be built this year.

These second homes are usually lake or beach houses. California's desert is also developing into a weekend resort. In New England, old farms and barns are in demand. Regardless of where the second home is located, it is certain to mean increased business for the telephone company.

•

The writer recently enjoyed attending a meeting in the office of the Rural Electrification Administration, in Washington, D. C., on revision of their specifications for plastic-insulated wire and cable. In this connection, the REA engineers have done a wonderful job in developing these specifications and in coordinating them with industry.

The revised specifications will make use of the Munsell color system for the 10 master colors of the cable color code. High molecular polyethylene will be used in all cable. A double jacket is specified for cable designed for direct burial. Cable with an 0.005-inch annealed copper shield is intended for use in areas where gopher attacks are not anticipated. This cable is expected to withstand attack by termites and small rodents, such as field mice.

Cable with a 0.010-inch shield is designed for use in areas where gopher attack is probable. It is understood that REA has experienced only about three cases of gopher trouble and they have over 5,000 miles of buried wire and cable in service.

The cable furnished under the new REA specifications will have sequentially numbered length markers at regular intervals of not more than 2 feet along the outside of the jacket. This is an idea that should pay big dividends.

Draft copies of the proposed specifications will be forwarded to all cable manufacturers in the near future. Their comments and recommendations will be requested. This information will then be considered in the preparation of the new specifications.

A meeting was to be arranged, probably in early November, to explain and discuss the new specifications with the various cable manufacturers.

•

Communicators interested in "Basic Audio" should have a set of books (three volumes) on this subject that can be purchased from TELEPHONY in soft cover for $2.90 per volume or the three-volume set for $8.70.

To many people, the word "audio" means "high fidelity" reproduction. To others, it means the reproduction of sound in many areas of application. The full enjoyment of what hi fi has to offer (package or component) is open to everyone with this thorough, easy-to-understand "picture-book" course.

If the interest is in some other branch of the audio field, this course explains clearly and simply the part that each component of an audio system plays in producing the end result. Beyond a knowledge of electricity at the basic level, no previous experience or education is necessary to obtain maximum benefit from this "learn-by-pictures" course.

Whatever electronics and circuit theory is required to assemble or operate a hi-fi system or audio reproduction system, is given in this course.

•

Some of the Bell companies are now eliminating the cable vaults in fairly large exchanges.

The conduit runs slant up from the underground and cables are racked along the building wall in the rear of the main frame.

The tipping cables are then run up and over on a rack to the protector verticals. More space is required between the main frame and the wall than when a cable vault is used.

A back door is provided near the main frame so that cablemen need not go through the equipment room to reach their work in the rear of the main frame.

This arrangement will probably not do much to improve the appearance of an exchange, but it should permit considerable savings. Cable vaults are always expensive and more especially so in a building without a basement.

•

Two Cornell University sociologists have made an eight-year study and determined—contrary to general belief—that retirement does not lead to downhill health.

A favorable and realistic attitude toward retirement seems to be the most important thing. Affection, personal visits, and letters from children were ranked by retired people as more important than material help from their children.

•

An economist is described as somebody who tells you what to do with your money after you've done something else with it.

GERSHWIN

POLLY BERGEN

MARGE and GOWER CHAMPION

VIC DAMONE

ELLA FITZGERALD

ANDRE PREVIN

Musical Advisor: IRA GERSHWIN

Featuring DONALD VOORHEES and the
BELL TELEPHONE ORCHESTRA

BELL TELEPHONE HOUR

Friday, November 20, NBC-TV

A FULL HOUR OF MUSICAL TREASURES BY ONE OF AMERICA'S FAVORITE COMPOSERS —BROUGHT TO YOU LIVE AND IN COLOR

The next Bell Telephone Hour is sure to be enjoyed by everyone who loves good music. We hope that you and your family will make a date to see and hear the wonderful music of George Gershwin performed by an outstanding cast of popular artists.

The commercials, because they're on nationwide TV, will help the sales efforts of telephone companies everywhere. The subjects to be treated are the convenience of extension phones wherever needed in the home, the usefulness and value of the telephone in our daily lives, and the many pleasant reasons for keeping in touch with family and friends by Long Distance.

CHECK YOUR LOCAL TV LISTINGS FOR TIME AND CHANNEL IN YOUR COMMUNITY. FRIDAY, NOVEMBER 20, 8:30— 9:30 P.M., E. S.T.

PRESENTED BY THE

BELL TELEPHONE SYSTEM

TANE Brings New Englanders Together in First Convention

By GARDNER HOPWOOD*

THE MAINE, NEW HAMPSHIRE and Vermont Telephone associations met for their first joint convention under the new organization of TANE—The Telephone Association of New England—at the Mount Washington Hotel, Bretton Woods, N. H., on Sept. 20 to 23, with 200 members and guests attending.

Eugene A. Van Den Kerckhoven, presiding, called the convention to order. The welcome was extended by Merrick E. Wheeler of Springfield, Vt., TANE president, followed by greetings from the telephone associations of Maine, New Hampshire, and Vermont.

The speaker of the first day, Percy E. Thompson, New England Telephone & Telegraph Co., Independent company relations supervisor-Maine, discussed the importance of a sales program in the Independent industry.

A program of fun on the opening day included tennis, swimming, and a trip on the cog railway train to the "Top of New England."

John R. Coughlin, plant extension engineer of the General Telephone Co., who spoke on "Planning for the Future," and Gerald Paul, engineer of Stromberg-Carlson Co., discussing "Equipment in the Future," gave emphasis to the forward outlook of the convention.

A message from the perspective of the public utilities commission was given on the second day of the meeting by Harold Davison, chairman of the New Hampshire Public Utilities Commission.

Problems in the subject areas of accounting, commercial, plant-equipment and public relations were among the topics taken up in the workshops during the convention.

At the final session, Mr. Wheeler announced the election of the TANE officers for 1959-60 as follows: President, Mr. Wheeler; vice president, John W. Connor of Winthrop, Me.; and secretary-treasurer, Gardner Hopwood, of Marshfield, Vt.

President Erskine N. White of the New England Telephone & Telegraph Co., in his talk, "Managing an Enterprise in These Changing Times," brought before the convention the major address, giving the pertinent facts of increasing population, taxes, expenses, and higher production costs, and told how the whole frame of reference has changed.

*Mr. Hopwood is manager of the Molly's Falls Telephone Co., Marshfield, Vt., and secretary-treasurer of the Telephone Association of New England.

Erskine N. White, president of the New England Telephone & Telegraph Co., was the principal speaker at the first meeting of the Telephone Association of New England (TANE).

Mr. White began his talk with comments on the present economic, political and social atmosphere, and quickly reviewed the effect these changes have had on the job of managing a business enterprise.

By contrast with earlier patterns of business life and thought, he reminded his audience that today, "so many of our decisions fall not into a black or white area, but in the gray areas of management."

He continued, "I don't look at this with any degree of discouragement

(Continued on page 50)

LEFT PHOTO: TANE, the newly-organized Telephone Association of New England, unites the associations of the Independent telephone companies of the area, with these men as officers. Seated at left: John W. Connor of Winthrop, Me., vice president; standing in center, Merrick E. Wheeler, of Springfield, Vt., president; and seated, right, Gardner Hopwood, of Marshfield, Vt., secretary-treasurer. RIGHT PHOTO: This informal conversation group includes the operating managers of five of the six New England states represented at the TANE meeting. Left to right, they are: George Twombly of Standish, Me.; Gardner Hopwood; A. J. White of Contoocock, N. H.; Alston D. Mugnier of Granby, Mass., and Percy R. Savage of Woodbury, Conn.

THE Operator's Corner

By MAYME WORKMAN — TRAFFIC EDITOR

NOW THAT their summer frolicking is over, many young June graduates have entered the business world for the first time and, as in the past, telephone companies will receive their share of job applicants in the traffic, commercial, accounting, and plant departments.

Each applicant deserves a proper interview. This should be done either by a trained personnel interviewer or a person qualified to conduct an effective interview from the applicant's standpoint as well as the company's.

According to an article appearing in *Today's Secretary*, those on the brink of a career often find themselves walking "the last mile" before they've as much as taken a first step in their new jobs.

At the end of this tremulous trip—a door, and behind the door—a chair. Across from the chair—the personnel interviewer.

But here the analogy ends. The job applicant decides her own fate. She can sell herself, or sell herself short. According to the opinion of three top ranking women in industry, the personal interview is the "do or die" of a successful business venture. Favorable word of mouth reports may herald our heroine's arrival; words *from* her mouth can quickly burst the bubble.

Corinne McCue, New York employment supervisor, Remington Rand, emphasizes this fact. "We consider the personal interview all important in selecting proper personnel. Specific skills must be tested, but the speediest stenographer is not always the best employe. We want to know what kind of a person we are hiring."

This rule applies to tests given by telephone companies as well.

Bristol-Myer's Catherine Ready distinguishes between the "can do" and "will do" factors. The "can do" involves past experiences which show up on job applications.

It's the much more important "will do," which concerns the motivations, personality, and appearance of the job candidate, that must be evaluated during the personal interview.

The importance of personal contact, then, is that it provides real insights into applicants. Success, of course, depends on the skill of the interviewer and the communicativeness of the candidate, but this does not decrease the confidence which Ethel Sutton, personnel relations, McGraw-Hill Book Co. places in the interview.

"An unfavorable interview will raise doubts about the suitability of an applicant—even though her record and recommendations are excellent," Mrs. Sutton says.

"Dependability, impression on others, and ability to get along with co-workers" are the main factors considered by Miss McCue.

Miss Ready looks for "a well-groomed, alert, composed young lady, who volunteers information about herself. She must help create a friendly atmosphere."

Mrs. Sutton looks for "promptness, good grooming, correct English, wholesome attitudes, and interest in the company. They seem to take care of themselves in that order."

What not to do? "Don't ask about money and benefits," urges Miss McCue. "Both are understandably important factors to the applicant, but interest in what the job responsibilities are worth is far preferable to questions about salary."

Mrs. Sutton finds the most prevalent mistake among aspirants is one of omission. "It's a refusal to trust their own judgment and a lack of enthusiasm about improving their basic skills."

How to gain a place on Miss Ready's black list? "Applicants who fail to call for an appointment but wander in and expect to be received royally are eligible," she states. "Especially when they're accompanied by a friend and a 'the world owes me a living' attitude."

It is well for applicants to remember there's no need for nerves—it's an interview, not the Inquisition. And remember, too, "they can lead an interviewee to water, but they can't make her sink."

So here we have the opinions of three outstanding people in their field. We can use their knowledge and experience to good advantage, as applicants or as interviewers, Most of their suggestions and ideas can be incorporated in our business.

A personnel interviewer made the following remark to me recently: "I am embarrassed when I have to interview an applicant. There is no privacy for the interview. It is difficult to concentrate and most applicants display nervousness. This situation is not conducive to encourage an applicant to seriously consider working for the company."

Applicants should be interviewed in a proper atmosphere. They and the interviewer are entitled to this consideration in order to obtain satisfactory results.

Traffic Questions

(1) When an outward operator is handling a WH party report, if the TTC does not give the needed operator number, how do you proceed to obtain it?

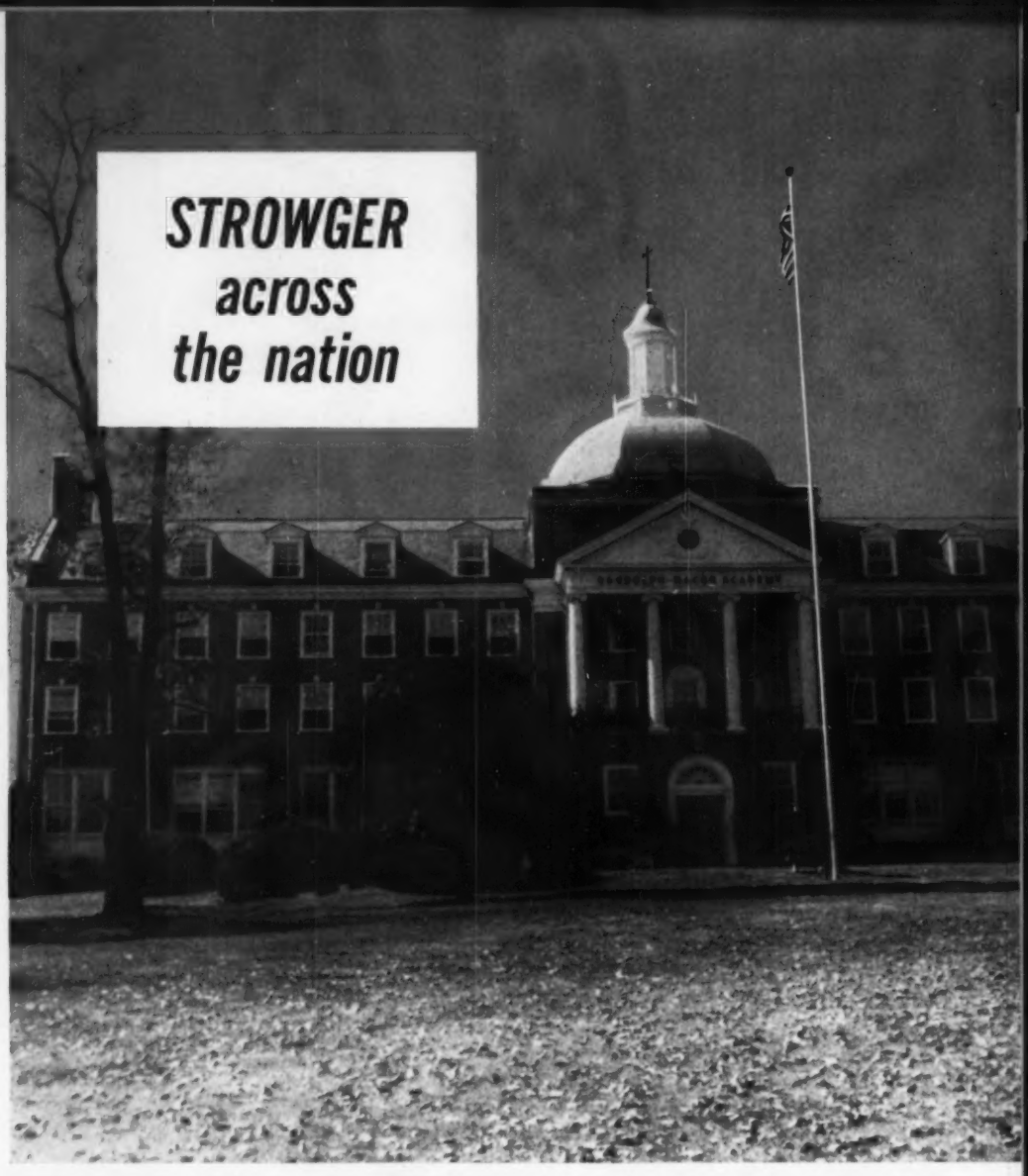
(2) When a ticket is received at the ticket position with "WH" in the "spec. inst." space, should it be matched with the cancels when a report charge is involved?

(3) What entry and disposition should be made of a ticket received at the ticket position with "WH" in the "spec. inst." space when a report charge is involved?

(4) When a request for ticket details is received at the ticket position, how should the operator proceed?

(5) If the operator at the ticket position has not located the original ticket at the end of one minute from the time she received the request; or sooner if the search has been completed, what report should be given to the calling operator?

Answers are presented on page 64



RANDOLPH-MACON ACADEMY, nationally famous preparatory school for boys, is located in Front Royal. The city has a variety of clubs and fraternal organizations. Agriculture is diversified—includes farming, cattle, orchards, and chinchilla ranching. Population is estimated at 9,000.

FRONT ROYAL, VIRGINIA

An army sergeant's command gave this city its unique name in 1788 and now it attracts one million tourists annually

Front Royal, Virginia, in Warren County, lies just north of Shenandoah National Park. In colonial days, a giant oak—the "royal" tree of England—stood in the public square. To assemble the militia in the square at one time was a problem. Army commands proved futile. One day, a weary drill sergeant coined the phrase: "Front the royal oak!" The command proved successful. Not long after, the town was named Front Royal.

Tourists find the Front Royal region memorable for its natural beauty and invigorating climate. On Skyline Drive, motorists see famed Shenandoah National Park, which extends 105 miles over the crest of the Blue Ridge Mountains. The park offers excellent bass and trout fishing in the many mountain streams.

Front Royal is served by Virginia Telephone and Telegraph Company. Each day, Automatic Electric step-by-step switches work behind the scenes to give dependable, low-cost telephone service. Yes, Front Royal, Virginia is another success story of Strowger Across the Nation.

VIRGINIA TELEPHONE & TELEGRAPH COMPANY recently built this modern structure to house the Front Royal business office and exchange. The Front Royal exchange, with a total of 2,400 lines, was converted to dial service in October, 1958. Virginia T. & T. chose Strowger Automatic equipment to make its conversion.

AMERICAN VISCOSE rayon plant is largest of its kind in the world. Other firms include Old Virginia Packing Co., Stauffer Chemical and Riverton Lime & Stone Corp. Some of the products manufactured and processed at Front Royal include limestone, rockwool, rayons, jellies, silks and chemicals. Annual industrial payroll amounts to about $14,000,000.

SKYLINE CAVERNS is one of the world's outstanding subterranean attractions. Here are seen the only known Anthodites, flower-like calcite formations (above). Geologists estimate it takes 7,000 years to form one inch of this formation. The caverns also offer unobstructed views of stalagmites, stalactites, 37′ waterfalls and snow-white flowstone.

FIRST DIAL CALL from Front Royal is placed by Mayor Clarence Gregory. On hand for the cutover ceremony were (left to right) George Massey, secretary, Front Royal Chamber of Commerce; J. B. Compton, district manager, Virginia T. & T.; and Drayton Norcum, local radio station representative.

AUTOMATIC ELECTRIC

Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM

Courts and Commissions

Authorize Rate Schedule Effective on Neb. Cut-Over

The Capitol Telephone Co., Hickman, was given authority on Oct. 9 by the Nebraska Railway Commission to establish a schedule of monthly rates, effective with conversion of its exchanges to dial operation, and to correct its Hickman exchange area map (TELEPHONY, Sept. 26).

The following monthly rates were approved:

Class of Service	*Group 1*	*Group 2*	*Group 3*	*Group 4*
One-party business	$8.50	$8.75	$9.00	$9.25
Two-party business	7.75	8.00	8.25	8.50
Four-party business	7.25	7.50	7.75	8.00
Multi-party rural business	6.50	6.75	7.00	7.25
One-party residence	5.70	5.80	5.90	6.00
Two-party residence	4.95	5.05	5.15	5.25
Four-party residence	4.70	4.80	4.90	5.00
Multi-party rural residence	4.70	4.80	4.90	5.00

The company serves exchanges at Alvo, Eagle, Cortland, Firth, Hickman and Martell.

It is now in the process of modernizing its facilities, including the installation of dial service. The estimated cost of telephone plant, plus $4,100 working capital, for this project was listed as $736,000. This equals the amount of the REA loan obtained by the company.

Estimated annual operating revenues computed on the new schedule of rates were shown as $83,284.69; with operating expenses, including taxes, listed as $65,276.66. This is estimated to produce net operating revenues of $18,008.03.

Five-for-One Stock Split Approved for N. C. Company

The stockholders of Carolina Telephone & Telegraph Co., Tarboro, N. C., at a special meeting held in the company's offices on Oct. 23, approved a split of the company's capital stock. The split of the company's stock on a five-for-one basis was recommended by the board of directors on September 11.

The effect of the stock split is to reduce the par value of the present common capital stock from $100 per share to $20 per share.

In presenting the recommendation of the board of directors, Carolina T&T President H. Dail Holderness said the proposal to split the stock was made in order to secure a wider distribution of the capital stock. He added that no increase in the dividend rate was planned because of the change in the par value of the stock.

He advised the stockholders that a petition had been filed with the North Carolina Utilities Commission covering the proposed change in the par value of the company's stock and that an order had been issued by that agency authorizing the change.

Four additional shares were to be issued for each share held by existing stockholders on Oct. 30 and the par value of the old shares outstanding was to be reduced from $100 per share to $20 per share.

It is expected that the additional shares will be issued in late November or early December, 1959.

Protest Against Use Tax Under Advisement in Neb.

Following a hearing on Oct. 27, the Nebraska Railway Commission took under advisement a protest by the city of Scottsbluff against an assessment of 80¢ per subscriber made by the United Telephone Co. of the West to offset the cost of a $3,600 occupation tax imposed by the city (TELEPHONY, Oct. 10).

The city was given 15 days in which to file a brief, after which the company will have 10 days in which to file a reply. The city contends the assessment cannot be authorized without a public hearing.

Set Rate Hearing in Florida

The Florida Railroad & Public Utilities Commission has set a Nov. 19 hearing date on the application of the Tri-County Telephone Co., Bonifay, for a rate increase. The Tri-County company wishes to apply the raise to its exchanges at Bonifay, Cottondale, Grand Ridge, Seagrove Beach, Sneads and Westville.

Approve Dial Service Raise For Minnesota Company

The Minnesota Railroad & Warehouse Commission on Oct. 26 granted a rate increase to the Viking Telephone Co., Hanska, effective on conversion to dial service.

The Viking company, which serves about 166 local and 295 rural stations, has invested approximately $110,000 in a dial rehabilitation program. Cut-over was set for Oct. 18, 1959.

Under the new rates, the company's net operating revenues will increase from $24,348 to $30,288. Net income will rise from $4,565 to $9,478 giving the company a 5.94 per cent return instead of a 2.86 per cent return on a current value rate base of $159,396.

Old and new rates are as follows:

	Old	*New*
One-party business	$5.25	$7.50
Two-party business	4.50	6.75
Multi-party rural business	5.00	6.50
One-party residence	4.00	5.25
Two-party residence	...	4.50
Four-party residence	3.00	3.75
Multi-party rural residence	4.00	4.50

Two Georgia Companies Receive Rate Raises

The Georgia Public Service Commission on Oct. 9 granted the petition of the Nelson-Ball Ground Telephone Co., Ball Ground, to increase its rates.

The company was also authorized to borrow $430,000 from the Rural Electrification Administration to establish a dial exchange at Marble Hill.

The company had asked for total operating revenues of $102,413 which would have provided net operating revenues of $22,230. The commission granted rates sufficient to produce $98,117 in total operating revenues, giving the company net operating revenues of $21,279.

This takes into account that when the current REA program is completed, some 1,450 subscribers will be served, including about 442 multi-party rural subscribers.

The new rates granted affect only multi-party rural subscribers. Compared with old rates, these are as follows:

	Old	*New*
Multi-party rural business	$4.75	$5.00
Multi-party rural residence	3.75	4.00

Also in Georgia, the General Telephone Co. of the Southeast was allowed to put a deferred rate increase into effect at its Montezuma exchange (TELEPHONY, Aug. 15, 1959).

In its order of May 20, 1959, granting raises at General of Southeast exchanges, the commission had deferred any increase at Montezuma pending corrections of reported service deficiencies.

The company demonstrated that improvements had been made including an overhauling of the central office equipment and the installation of an additional 100 lines, as well as the addition of personnel to the exchange.

Two Independents Acquire Exchanges in Indiana

The Indiana Public Service Commission on Oct. 24 was reported to have granted the Clay County Rural Telephone Cooperative, Inc., authority to take over the Cloverdale and Eminence exchanges of the Indiana Midland Telephone Corp., New Richmond. The commission also gave approval for General Telephone Co. of Indiana, Fort Wayne, to take over the Putnamville exchange of the Indiana Midland company

The commission ordered both companies to rebuild the telephone plants involved, and noted that the Clay County company had received an REA loan for the purpose.

Prior to this action of the commission, the General company had sought to buy all the assets of Indiana Midland, the report stated.

OK Special Neb. Telephones

On Oct. 13 the Nebraska Railway Commission approved the applications of The Lincoln Telephone & Telegraph Co. to offer specially equipped telephones for use at hazardous locations at a monthly rate of $5.00 in addition to regular charges; discontinue the $10 monthly charge for attendant's cabinets for automatic ringing on dial PBX systems; and discontinue the initial contract period of five years for installations of multiple line equipment (TELEPHONY, Oct. 24).

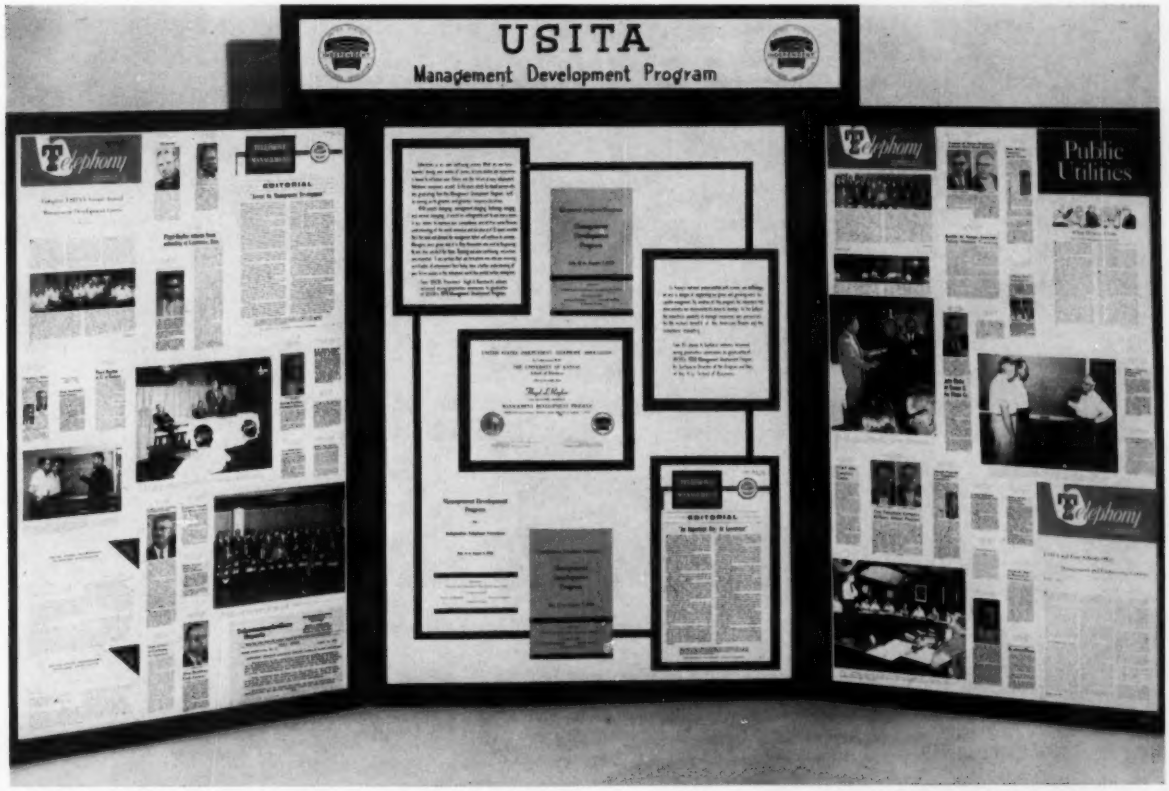
New York Subscribers Asking for EAS

The New York Public Service Commission will hold a public hearing on Dec. 9, in Rochester to consider complaints filed by 83 Fairport subscribers of the Rochester Telephone Corp. protesting their inability to obtain toll-free service to Rochester. Examiner F. Leonard Titus will preside.

These subscribers are now served through the company's Fairport exchange. They are asking that service be provided them from the Pittsford-East Rochester exchange in order that they may have toll-free service between their homes and Rochester.

The complainants allege that nearby residents of the areas in which they

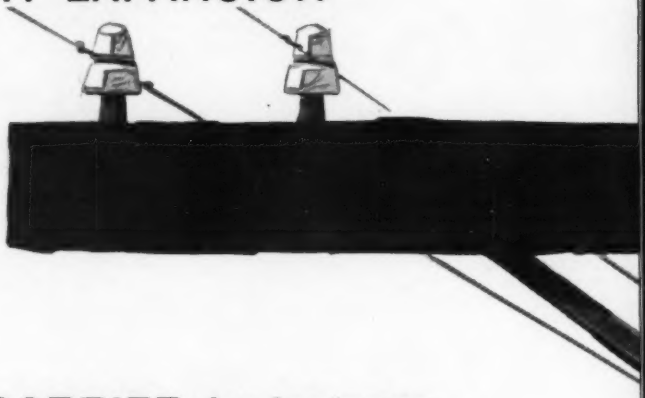
(Continued on page 42)



Exhibited at the recent United States Independent Telephone Association Convention was this display of magazine, newspaper and news letter coverage given USITA's second annual Management Development Program. The course, given at the University of Kansas, Lawrence, covered the four weeks ending Aug. 7.

AE-Lenkurt

HAS **EVERYTHING** YOU NEED FOR PROFITABLE CIRCUIT EXPANSION



LENKURT SHORT-HAUL CARRIER, for instance . . .

Lenkurt's Type 45C family of open-wire carrier systems offers an inexpensive way of expanding circuit groups beyond the capacity of low-frequency carrier.

Types 45CA, CB, CC and CD provide four 4-channel allocations in the frequency range of 2 kc. to 156 kc., with all the advantages of Type 45 equipment for large circuit groups. In addition, the Type 45C terminals provide direct interconnection at carrier frequencies with all other 45-class systems for open-wire, cable or radio, and coordinate with W. E. Type O carrier.

Type 45C systems are transistorized, require a minimum of space, and employ interchangeable plug-in channel units. And each channel has its own compandor and regulator.

The AE-Lenkurt team of *telephone* engineers will handle as much of the planning and installation as you wish. And AE will provide "follow-thru" service *for the life of the equipment.*

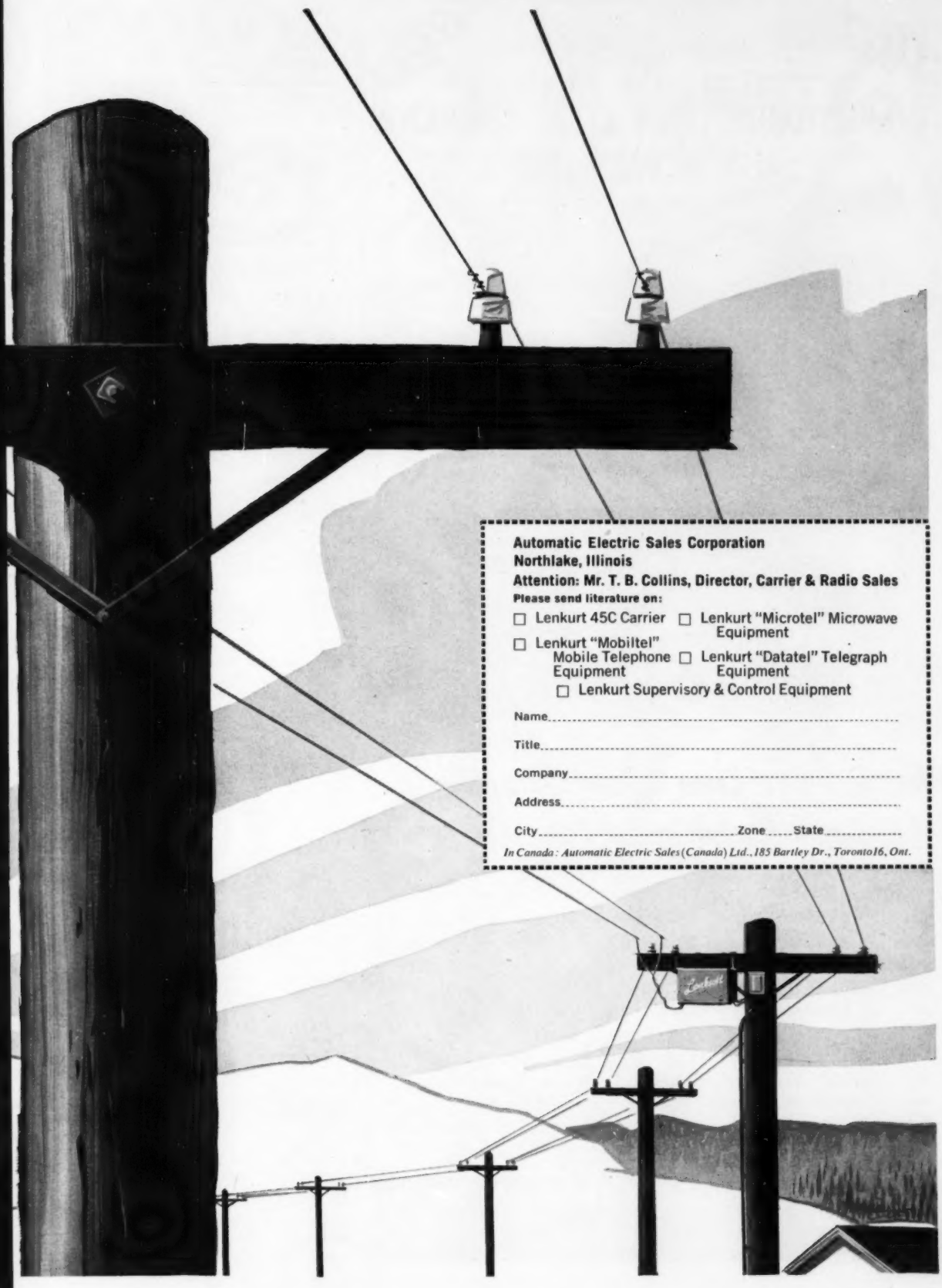
For full information on the Lenkurt Type 45C systems or companion equipment, call your Automatic Electric representative, or fill in and mail coupon today.

ALL YOUR COMMUNICATIONS NEEDS
FROM ONE
DEPENDABLE SOURCE

AUTOMATIC ELECTRIC

Subsidiary of
GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM



Automatic Electric Sales Corporation
Northlake, Illinois
Attention: Mr. T. B. Collins, Director, Carrier & Radio Sales

Please send literature on:

- ☐ Lenkurt 45C Carrier
- ☐ Lenkurt "Microtel" Microwave Equipment
- ☐ Lenkurt "Mobiltel" Mobile Telephone Equipment
- ☐ Lenkurt "Datatel" Telegraph Equipment
- ☐ Lenkurt Supervisory & Control Equipment

Name.....

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City..... Zone..... State.....

In Canada: Automatic Electric Sales (Canada) Ltd., 185 Bartley Dr., Toronto 16, Ont.

CEECO Type C16A

TRANSISTORIZED 1000-CYCLE GENERATOR AND DECIBEL METER

TYPE C16A METER CASE

TYPE CV OSCILLATOR

Check Your Line Losses Easily . . .

End Customer Complaints of Poor Transmission

Take your own direct circuit readings from either end of cable —from any cable terminal to determine loading values.

Check and locate trouble in carrier systems and audio circuits.

Case measures 9½" long, 6¼" wide, 3¾" high. Weighs only 4 lbs.

Equipped with test terminals and test leads with clips—also jack for oscillator plug—meter scales read —10 DB 0 DB +10 DB.

Oscillator measures 2¼"x3"x4" and weighs 10.3 ounces.

Will operate 700 hours continuously—much longer, intermittently on self contained 2 cell mercury battery.

Sold through all telephone equipment suppliers—attractively priced—complete set $148.00 FOB Chicago, Ill.

COMMUNICATION EQUIPMENT & ENGINEERING COMPANY
5646 West Race Avenue • Chicago 44, Illinois
Phone EStebrook 8-3109

reside receive toll-free service to Rochester through the Pittsford-East Rochester exchange. They seek the same service because of their frequent need to make calls to persons and firms in Rochester.

New York Company Gets Dial Rate Raise

The New York Public Service Commission on Oct. 28 accepted a tariff amendment filed by the Trumansburg Home Telephone Co. to increase the rates of dial exchanges at Trumansburg and Ovid, effective Nov. 1.

Unaffected by the increase are rates of the company's manual exchange at Interlaken, which are now the same as dial service.

In filing its new tariff, the company reported that its operating expenses for the next 12 months will exceed those of 1958 by almost 30 thousand dollars, largely attributable to increased payrolls.

It is estimated that the new rates will produce about $17,800 additional annual revenue to offset partially the higher operating costs.

The Trumansburg company serves about 4,000 stations in and near Trumansburg, Ovid and Interlaken and portions of areas which lie between Seneca and Cayuga lakes.

A comparison of the old and new rates for dial service is as follows:

	Old	*New*
One-party residence	$4.50	$5.75
Two-party residence	3.75	4.75
Four-party residence	3.25	3.75
Rural residence	3.25	3.75
One-party business	6.00	7.50
Two-party business	5.25	6.00
Four-party business	4.75	5.25
Ten-party rural business	4.00	4.75

Ask Stock Issue in N. Y.

The Rochester (N. Y.) Telephone Corp. filed a petition with the New York Public Service Commission, to have been heard on Oct. 23, for the issue of 50 thousand shares of cumulative preferred stock. It was stated that arrangements have been made to sell the issue to a group of private investors.

Two in Wis. Ask Raises

The Wisconsin Public Service Commission on Nov. 4 and 6 respectively was to have heard the rate applications of the English Lake Telephone Co., Manitowoc, and of the Cameron Farmers Telephone Co.

Brief Victory

"Force is all-conquering, but its victories are short-lived."—ABRAHAM LINCOLN.

Communications-Electronics Terminology Manual Issued

A new Air Force manual, "Communications-Electronics Terminology," has been compiled at Maxwell Air Force Base, Ala., by Air University's Research Studies Institute.

Col. William H. Lyle heads the Communications-Electronics Doctrinal Project Office, which undertook the job of producing the manual which serves as a technical dictionary for communications-electronics officers. The same agency will make annual revisions of the publication.

The new book, Air Force Manual 100-39, will be available to civilians through the Government Printing Office in Washington. "This is in keeping with Air Force's policy of disseminating useful communications-electronics information, not only to the other services but also to industry and commercial activities as well," said Colonel Lyle.

The volume provides complete cross-references, listings of terms, nicknames, designations, abbreviations and definitions used in military and civilian communications and electronics, including the field of astronautics.

"Apes" Don't Think

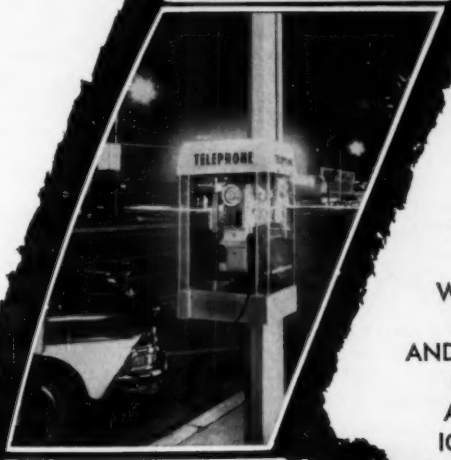
"Where all have the right to speak, some foolish speaking is done. But where, as in a dictatorship, all speak alike, little thinking is done."—FRANK L. WEIL.

As a security measure, The Southern Nevada Telephone Co., Las Vegas, mounted this paystation on a dolly provided by the police department for use in the city jail. The telephone can be wheeled to a cell for use by prisoners without the necessity to remove them from confinement under guard.

THROUGHOUT NORTH AMERICA, GLADWIN'S

"BOOTHETTE"

HAS STOOD THE TEST OF TIME . . . FROM SANDY BEACHES AND DRY WESTERN WINDS, TO THE WINTRY BLASTS OF THE FAR NORTH, THE BOOTHETTE IS A BRIGHT BEACON TO ALL WHO PASS—



APPROVED FOR INTRA-STATE HIGHWAY INSTALLATION, THE BOOTHETTE CHEERFULLY WITHSTANDS THE SALT AIR, SAND AND SPRAY OF THE COASTAL AREAS AS WELL AS THE ICY COLD BLASTS THAT SING DOWN ACROSS THE GREAT LAKES REGIONS. WHETHER IT BE FOR DRIVE-UP OR PEDESTRIAN INSTALLATION, CHEERFUL DEPENDABILITY IS A GLADWIN BY-WORD.

GLADWIN PLASTICS, INC.

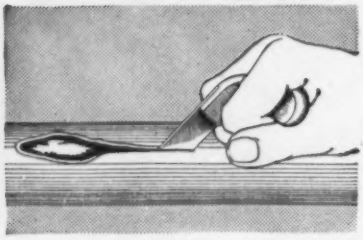
165 Courtland Street, N.E. Atlanta 3, Georgia

Phone — JAckson 5-5384

NEW KLEIN
slitting tool
for all types of control cable

Patents 2398979
2691822

Cat. No. 1558



Here is a new tool developed by Klein, designed to slit insulation from flexible cords, PWC, telephone cable with vinyl or polyethylene jackets and bus drop.

Handle of cast aluminum, light in weight and with convenient grip; knife of tempered tool steel may be sharpened and is easily removed for replacement. This tool slits insulation from a few inches to as many feet as desired swiftly and simply. Does not damage conductors inside weatherproof sheath.

Write for bulletin giving complete information.

FREE POCKET TOOL GUIDE

A free copy of the new Klein Pocket Tool Guide will be sent on request without obligation.

ASK YOUR SUPPLIER

Foreign Distributor:
International Standard
Electric Corp.
New York

Mathias KLEIN & Sons
Established 1857 Chicago, Ill., U.S.A.
7200 McCORMICK ROAD • CHICAGO 45, ILLINOIS

EVEN COUNT POLYETHYLENE INSULATED CABLE

Continued from page 22

where two 25-pair units are required in the center of a cable. To meet this need, a new type of unit called a "multi-unit" had to be developed.

A multi-unit is really a large unit made up of smaller units which add up to 50 pairs or two 25-pair groups. The use of multi-units is shown in *Fig. 9*.

When cables become large in physical dimension, a bulky splice would result if the sequence of the units in the two cables were not the same.

For this reason, in cables larger than 600 pairs it has been decided to slightly deviate from the system whereby each pair can be positively identified in a reel length. Absolute count, however, is obtained as soon as a cable is spliced into a run.

In the larger cables, we have resorted to what we call a mirror image arrangement in which the sequence of units appears the same at both ends of the cable. This gives the option of es-

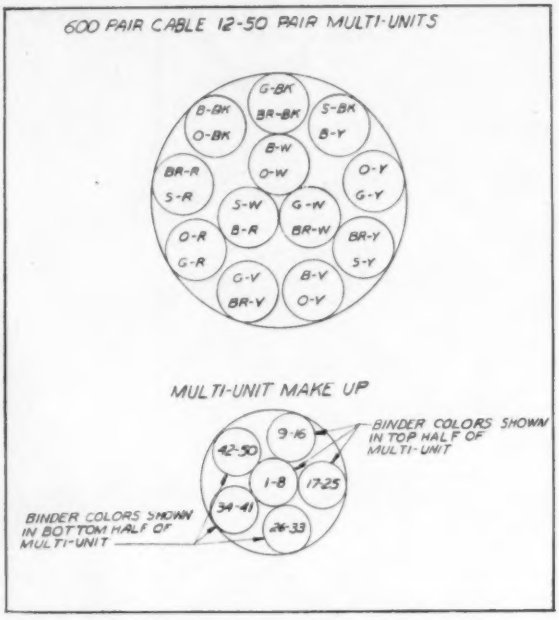


Fig. 9. Use of multi-units.

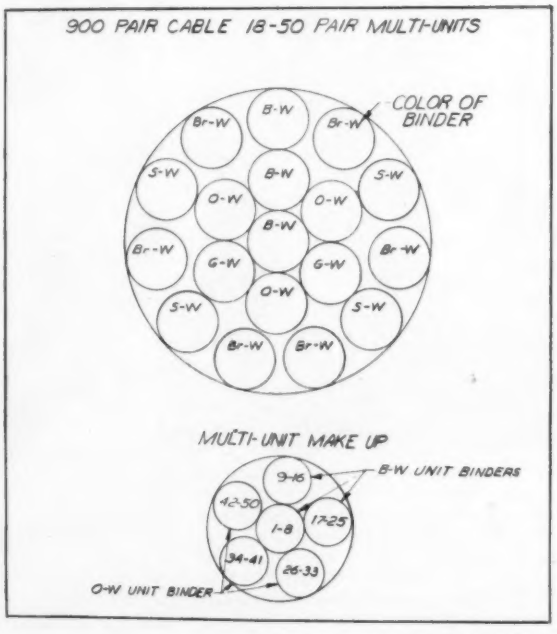


Fig. 10. Mirror image cable.

tablishing count from either direction (See *Fig. 10*). With this arrangement, it is not necessary to make unit cross-overs in order to match the correct units for splicing, and a bulky splice is avoided.

Absolute count is based on an arbitrary decision to face away from the central office and count in a clockwise direction from a designated starting point.

Multi-Units

The idea of multi-units involves the problem of forming small units into large units and then the large units into cables. All fixed carriage stranding or cabling operations involve a lay and each subsequent operation either tightens or loosens the previous lay.

To start with a small unit having a given lay, then tighten or loosen in two operations, results in an extremely kinky core which cannot be used. The intermediate stranding operation could be tolerated if the work were done on a floating carriage type of machine which does not twist the unit appreciably with the lengths of lay used in cable.

In fact, this is exactly the manner in which it was established that the principle would work. Floating carriage equipment is cumbersome however, if large or long lengths of units are involved.

A machine has been developed by the Western Electric Co. for processing the multi-units which does not impart the extra stranding lay. Cables processed from such units have proven satisfactory.

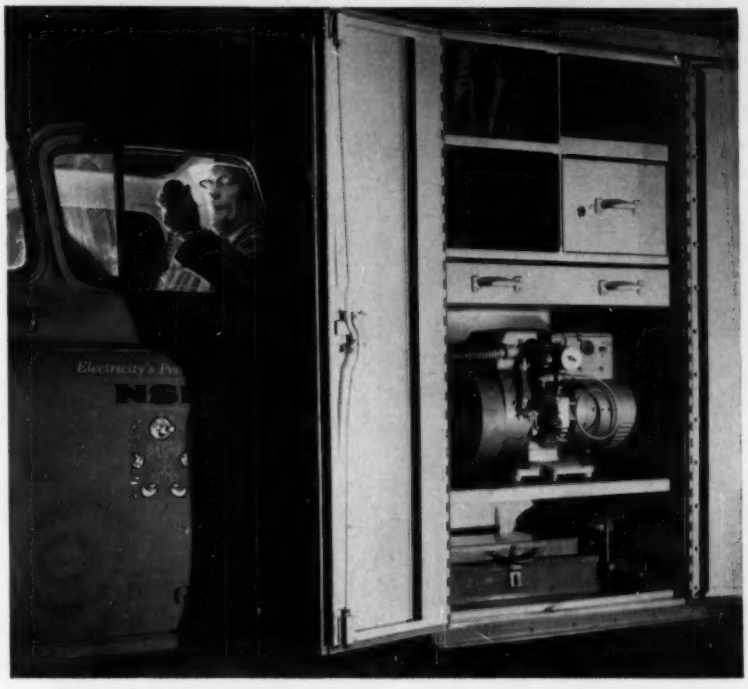
Before embarking on such a radical change in design as a twist system electrically compatible with all units or cable sizes, as well as multi-unit construction, experimental cables were made on improvised equipment to prove in the design. Measurements were made of all pertinent electrical characteristics.

With the reassuring mechanical and electrical results on the experimental cables, formal designs for a complete series of even count polyethylene insulated cables in 19-, 22-, 24- and 26-gauges were drawn up. All polyethylene insulated cable furnished for the past several months have been of the new even count series.

Confidence Does Not Probe

"We must not inquire too curiously into motives. They are apt to become feeble in the utterance; the aroma is mixed with the grosser air. We must keep the germinating grain away from the light."—GEORGE ELIOT.

Onan NEWS REPORT



Built-in dual-purpose electric plant

delivers 2KW for tools and lights; keeps batteries fully charged, too!

Utility construction and maintenance trucks like this one, use two kinds of auxiliary electric power . . . and the Onan Electric Plant provides both. Workmen can plug in on the plant for 2,000 watts of 115-volt, 60-cycle A.C. to operate electric tools like drills, saws, soldering irons and floodlights. Or the plant will deliver 30 amperes of 12-volt D.C. to handle the battery drain of 2-way radio and battery-powered lights.

The Onan's D.C. output makes it unnecessary to run the truck engine to keep batteries charged, making savings in fuel and engine maintenance totaling hundreds of dollars per year per truck.

Leading body builders now install these dual-purpose Onan plants on new vehicles or you can mount them on vehicles now in service. Onan's Vacu-Flo cooling system permits installation within a closed compartment. Where no space is available in the truck body, the plant can be neatly installed over the cab within a handsome weather-proof steel housing.

Dual-purpose utility models are available with either 1,000 or 2,000 watts A.C. Powered by smooth-running single-cylinder Onan air-cooled gasoline engine.

ONAN INSTAPAC

Instantaneous standby power for microwave systems. No interruption of any kind of signal. No moving parts. Can be fitted to existing standby installations.

Call the Onan distributor listed in your phone book or write for specifications.

D. W. ONAN & SONS INC.

ELECTRIC PLANTS GENERATORS ENGINES ENGINE-COMPRESSORS

3525 University Avenue S.E. • Minneapolis 14, Minnesota

Onan ELECTRIC PLANTS

A PRODUCT OF STAMPINGS, INC.

THIS TRENCH IS COSTING ONLY 1 CENT PER FOOT

with the

POW-R-SPADE TRENCHER

Unsolicited performance reports from actual users state that POW-R-SPADE narrow trenches cost only 1 cent to 3 cents per foot, *including labor.* (Many report much less than 1 cent per foot.) Digging speed varies from 1½ ft. to 17 ft. per minute depending on soil conditions. POW-R-SPADE is light, rugged, with minimum of maintenance. Shipped *completely* assembled. Neat, fast, professional trenches—3 in. wide to 24 in. deep, or 4 in. wide to 18 in. deep Send coupon today.

One man can transport from job to job.

Stampings, Inc., 321—24th St., Rock Island, Ill.
Please send literature on POW-R-SPADE:

NAME

COMPANY

STREET

CITY STATE

SOLVING TELEPHONE PAPERWORK PROBLEMS

Continued from page 25

extra drawings of original sketches; the customer has a better selection to choose from; and there are no more delays in receiving art work.

(2) Orders authorizing insertion of trade-mark advertising in the yellow pages. A company on the West Coast is making machine copies instead of retyping data on the insertion order. As a result, the work is being done by half the number of people formerly needed and the company is saving $38,000 a year in wages.

(3) Service orders authorizing directory changes.

(4) The master record of street directory subscribers.

•

Plant—The biggest use is to make copies of cable charts. In addition, copies are made of orders, instructions, notices, safety tips, and changes in operation procedures pertaining to the maintenance, repair and installation of telephones.

A southwestern company is disseminating copies of cable charts eight times faster and at one-fourth the cost since employing copying machines to do the work formerly done manually.

•

Traffic—Copies are made of teletype messages when the company's network is overloaded. These copies then are distributed by mail or messenger to local teletype customers.

By using copying machines, teletype

Department	*User*	*Applications*
Accounting	(1) Revenue accounting	(1) Extra copies of monthly bills and toll statements for customers.
	(2) Accounts receivable	(2) Copies of bill stubs returned by customers with their payments.
Commercial	(1) Sales office clerks	(1) Copies of key system or K plan charts.
Directory	(1) Salesmen, art department personnel.	(1) Copies of several advertising layouts are presented in brochure form to yellow page advertising space buyers.
	(2) Receiving clerks in national trade-mark section.	(2) Orders authorizing insertion of trade-mark advertising in the yellow pages are reproduced.
	(3) Street directory central file clerks.	(3) Duplicates of service orders authorizing directory changes.
	(4) Street directory central file clerks.	(4) Copies of the master record of street directory subscribers.
Plant	(1) Plant assignment office personnel, plant engineers.	(1) Copies of cable chart logs.
	(2) Secretaries of foremen and district superintendents.	(2) Copies of orders, instructions, notices, safety tips and changes in operating procedures pertaining to maintenance, repair and installation of telephones.
Traffic	(1) Teletype room clerks.	(1) Copies of teletype messages when the network is overloaded.

Ten major ways telephone companies use copying machines.

facilities are better utilized and customers receive faster service.

These are some of the ways copying machines are affording more efficient office procedures, improved accuracy and completeness of files, immediate time and money savings and better customer and employe relations.

Many telephone companies have taken advantage of this economical means of providing fast office reproduction. Their reward has been savings of thousands of dollars a year.

NEVADA CONVENTION

Continued from page 24

how well they cooperate in the use of it . . . So, I would imagine that in any way that you possibly can, you constantly try to keep the public informed on every aspect of your operations."

Among ways to do this, Mr. Clark mentioned advertising, bill inserts, newspaper publicity, talks before civic groups, and contact by employes with the community.

Collection policies needn't interfere with good public and customer relations, Paul R. Bond of Reno pointed out, in his talk "A New Look At Collections."

One facet which must be emphasized, he said, "is the selection of the right kind of people for the customer contact job."

Mr. Bond also urged that tape recordings of practice contacts be made during training.

The importance of collection policies to a telephone company, Mr. Bond stated, is brought out by the fact that any telephone company represents the *largest credit organization* in any city. When a telephone is installed, we in effect extend unlimited credit to that customer. He can immediately place calls anywhere in the world and it may be some weeks before a bill is even rendered.

One mistake he felt his company may have made before the advent of its new collection policy was that it gave more weight to the customer's willingness to pay within the company's time limits, rather than his ability to pay.

Describing their new policy he said:

"Under our new collection program we are now on a selective treatment program. We are selecting accounts for treatment based on credit information that we have in our files. We are moving in early in the month immediately after the bills are sent to the customers and are reviewing high toll users.

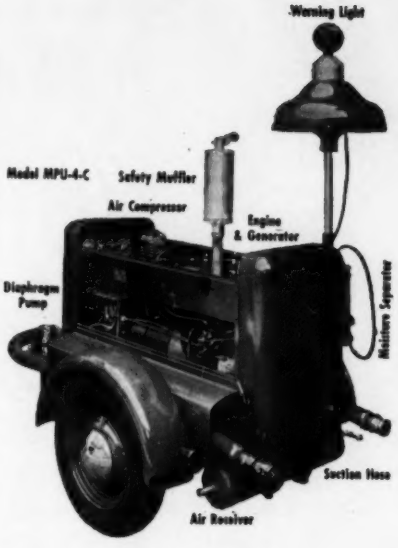
"In the case of new accounts, we are able to readily identify them as new accounts because on our credit card,

YOU CAN HAVE

S&G

A POWER AND PUMPING PLANT

THAT GOES ANYWHERE



MOBILE POWER UNIT

- Generator slow speed for quietness
- Pump—Diaphragm type to remove seepage and drain back
- Air Compressor — to put cables under pressure for cutovers or repairs

  Furnished with or without pump and compressor
- 300-Watt floodlight illuminates working area
- operates soldering pot and iron, electric and air tools
- electric blower to ventilate manhole
- supplies dry air for cable cutovers, flash testing, etc.
- diaphragm pump can be operated from manhole by push button control
- buzzer signal for summoning helper
- light, easy to handle

MODEL A Air Compressor Dehydrator

Exchange equipment designed to supply chemically dry air for telephone cables, aerial and underground, this unit can supply as many as 30 cables. The unit is equipped with volume recording air meter, high and low pressure alarm switches, humidstat and hour meter.

- Completely automatic in operation
- Air Purifier to eliminate oil mist
- Incorporates the latest safety devices

write or phone

S & G MANUFACTURING CORPORATION

P. O. Box 1309 • New Orleans 10, La. • JAckson 5-3142

we have a tear-off tab in the upper right hand corner which serves as a flag to the representative.

"When the toll usage is high on new accounts, and the credit information is not sufficient to warrant extending credit in large amounts, we contact these customers early in the month to develop more credit information and to arrive at a payment date.

"Our employes find that they can move in early each month on questionable accounts and are able to make personal telephone calls rather than send routine notices because we have now reduced the number of accounts being treated each month.

"Our experiences indicate that our losses are high among the new accounts who have had service less than a year. The slow account that has had service for a number of years is not a serious potential loss."

He continued:

"I think if you examine the kind of a treatment job that is being done in the various offices you will find that month after month we are treating the same accounts. You might ask yourselves, why do we then continue to send two or three notices each month to the same customers if they are not producing the desired results."

To combat this situation, he suggested a "personalized payment call."

This may be necessary, he stressed, because many customers don't read notices or don't take them seriously. The notices, in fact, seem to continually irritate customers, he said.

He summed up the objectives of his company's collection policy as follows:

"(1) Keep customer irritation to a minimum through a personalized approach which will afford individual rather than routine treatment.

"(2) Keep uncollectibles at a minimum through selective treatment and direct more attention and effort to potential losses.

"(3) Reduce expenses by avoiding unnecessary treatments."

Directors of the Nevada association for 1960 are Mr. Bond, Frank Dressler Sr. of Las Vegas, Mrs. Evelyn Gerow of Yerington, Mike Burns of Mesquite and John W. Christian Jr. of Pioche.

Officers are: President, Mr. Christian; vice president, Mrs. Gerow, and secretary-treasurer, Mr. Burns.

Nearly $3 Billion Equipment Sales in 1959, BDSA Predicts

The communications equipment manufacturing industry, facing a long-term expanding market, appears to be headed for a 1959 sales level approximating 2.65 billion dollars, which would be about on a par with the previous peak of 1956, the Communications Industries Division, Business & Defense Services Administration, U. S. Department of Commerce, said recently.

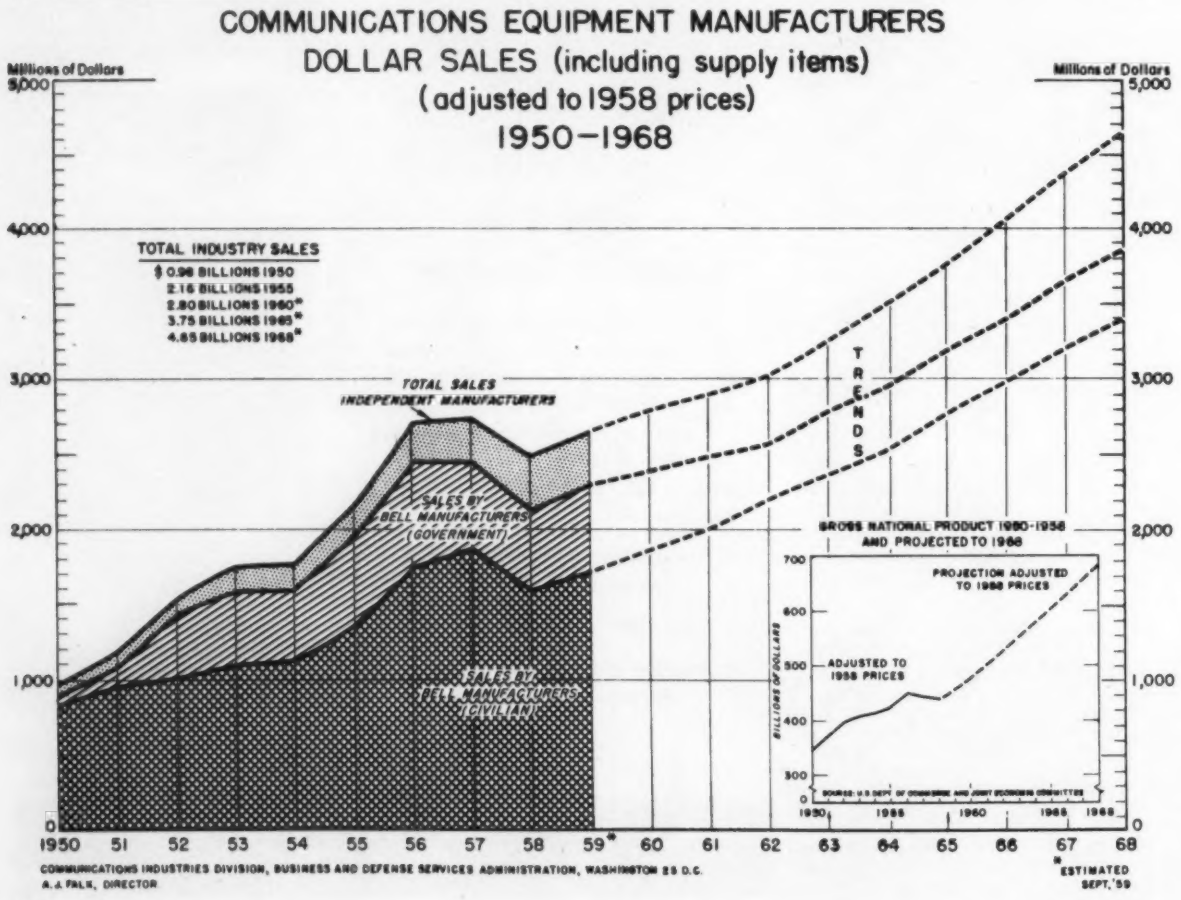
The prediction is based on the assumption that this industry would be late in experiencing impact from the steel strike.

Coupled with the immediate outlook, is a forecast that sales by 1968 should approximate 4.65 billion dollars, approaching twice the 1958 figure—2.48 billion dollars.

In 1950, sales were slightly less than 1 billion dollars.

The prospective trend in the next decade is based on the likely expansion of telephones in service to approximately 110.7 million units, and, what is considered a moderate estimate of the country's population growth, business expansion, new homes, and gross national product.

"Technological improvements in the facilities and services offered by the operating communications companies and an expansion of the research and development activities of the manufac-



turers have also been factors in subscriber demand," the BDSA said.

"To attain the levels forecast, considerable facility expansion and new construction will be required by the industry," the report added.

The division forecast, designed to aid industry programming, has been subdivided into three categories: (1) total sales by Bell manufacturers (civilian), (2) total sales by Bell manufacturers (government), and (3) total sales by the Independent manufacturers. The dollar sales have been converted into 1958 dollars and the trend indicates, according to the BDSA, that the prospective percentage gain in sales is greater than the gross national product and population growth of the country for the corresponding period.

The chart shown illustrates the trends developed by the survey.

Obituaries

ARTHUR L. MULLERGREN, consulting engineer and chairman of the board of Western Light & Telephone Co., Great Bend, Kan., died on Oct. 24, after an extended illness.

Mr. Mullergren had been associated with Western Light & Telephone for 25 years, serving as board chairman since 1949.

He was a member of the Society of Civil Engineers, the Society of Mechanical Engineers and the American Institute of Electrical Engineers.

Mr. Mullergren was born in Helena, Ark. and served as a captain during World War I.

•

JAMES R. KEARNEY JR., president of the James R. Kearney Corp. of St. Louis, died suddenly of a heart attack on Oct. 16.

Mr. Kearney had been associated with the electrical utility firm since his graduation from the University of Missouri School of Journalism, in 1926. He became president of the company in 1940. His father, who died 10 years ago, founded the firm.

Mr. Kearney was a director of the Manchester Bank of St. Louis, and a past president of the National Industrial Advertising Association and of the Industrial Marketing Club.

He is survived by his wife, Mrs. Christine S. Kearney; two sons, James R. Kearney III and David Charles Kearney; and a daughter, Mrs. John Mitchell Jr., of San Francisco.

•

FRANK A. GOULD, 50, who had been with the Harrisonburg (Va.) Telephone

"Super-Splice"®
makes splices
waterproof
...from
inside out!

Superior Cable's exclusive economical "Super-Splice" is a plastic splice sleeve. It is sealed at one end and comes to you filled with an insulating and waterproofing compound.*

"Super-Splice" prevents leakage currents and breakdowns in the presence of moisture . . . good for 25,000 v. d. c.

Can be easily removed to re-enter the splice . . . the compound never hardens or oozes out no matter what the temperature.

*A Dow-Corning silicone compound.

"Super-Splice" is available for use with straight, butt or bridge splices.

For further information on economical "SUPER-SPLICE", write

SUPERIOR CABLE
SUPERIOR CABLE CORPORATION
Hickory, North Carolina

Co. for a number of years, died recently in Los Angeles where he had been making his home.

Mr. Gould had served as general manager, traffic manager, and auditor of the Harrisonburg company. He was a past president of the Virginia Independent Telephone Association.

A native of Harrisonburg, he settled in California six years ago. He also had spent some time in Indiana, Illinois and Cincinnati.

Survivors include his father, Frank Gould; sister, Mrs. Margaret G. Durham; a daughter, Miss Mary Carpenter Gould, and a son Frank A. Gould Jr.

•

MRS. ESTHER MARTIN, 80, widow of the late telephone pioneer Talbot G. Martin, died in Chicago, Oct. 26.

Mr. Martin formerly served as vice president and chief engineer of Automatic Electric Co. During 42 years with the company, beginning in 1893, he was credited with 113 communications patents.

In 1934, AE engineers established the Talbot G. Martin Award to be presented annually "for outstanding contributions to the art of communication." He was the first man to receive this award.

Mrs. Martin is survived by a son, George T.

NEW ENGLAND CONVENTION

Continued from page 34

or concern. I think it is an indication of the temper of the times and the responsibilities we must face. And I am perfectly sure that just because there is a yellow light ahead, or a gray area, we can't stand still. We must go forward. Courage and wise judgment are at a premium as we manage our businesses today."

He indicated his belief that the changes are basic, and added, "new concepts of science, time, and the influence of government call for an acceptance and understanding on the part of management of the inevitable changes from the past.

"And if we are to meet our responsibilities to serve the best interests of our customers, share-owners and employes," he said, "we should:

"Reassess our business in terms of keeping it modern in all aspects.

"Appraise our business from the public's point of view.

"Develop new concepts of service.

"Strive to maintain maximum efficiency.

"And finally, as we broaden our concept of community living into the field of public affairs, we should live more closely with our public officials so that

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SLASH
Trench Costs

Model M-3, 9 HP, Illustrated

Amazing Trenchers
MODELS: C-3, 7 HP • M-3, 9 or 12 HP

DITCH WITCH

Produces Low Cost Trench

. . . overall cost less than any other machine or method! Usually about . . .

A FOOT

HOW IT'S BUILT: 7, 9 or 12 HP air cooled engine, 3-speed transmission, sealed ball bearings, 20M lb. test steel digging chain, replaceable teeth Studite edged, telescoping tubular steel boom, screw jack depth control —rugged throughout!

WHAT IT WILL DO: Trench at speeds up to 12 FPM, widths 3" to 12", depths 2' to 5', digs in any soil. Countless applications for utility service lines, gathering systems, signal systems, cathodic protection, street lighting, sprinkler systems, road crossings, etc.

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Distributors throughout the world sell, rent, and service Ditch Witch trenchers. Contractor's service is available everywhere at reasonable rates. For information, write, wire, or call!

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there may be a continuous understanding on our part of their problems and on their part of our management aims and objectives."

In summary, said Mr. White, "All of these are concepts on which we must work together—Independent as well as Bell System companies — to build a better communications industry for this country for the common benefit of all."

Professor Allen R. Foley of Dartmouth College entertained the audience with his special talk on "Vermont Humor," the concluding feature of the first convention of TANE.

Revised and New Standards Added to AWPA Manual

Ten revised and three new standards for inclusion in the American Wood-Preservers' Association (AWPA) Manual of Recommended Practice have been issued to all who have purchased copies of the Manual.

The publication of these standards was announced by AWPA President G. Q. Lumsden. Mr. Lumsden is timber products engineer at the Bell Telephone Laboratories, Murray Hill, N. J.

The revised and new standards incorporate recommendations of technical committees of the association, approved at the 1959 annual meeting and later confirmed by letter ballot vote of all members of AWPA.

Included in the new standards are specifications for the pressure treatment of wood used on farms, the fire-retardant treatment of plywood by pressure processes and a standard method for determining water and oil-type preservatives.

The standard for pressure treatment of piles and timbers in marine construction has been completely revised.

Revisions also include the addition of a specification for treatment of redwood in the standards for treatment of lumber, timbers and bridge or mine ties; and the addition of acid copper chromate, ammoniacal copper arsenite, chromated copper arsenate, chromated zinc arsenate and copperized chromated zinc chloride for treatment of Pacific Coast Douglas fir, southern pine, oak and gum for various parts of railroad car construction.

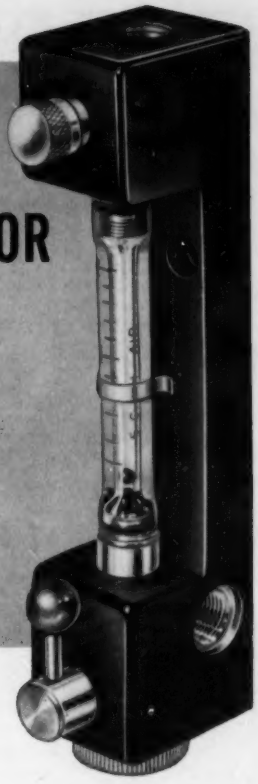
The AWPA Manual, a technical handbook used by persons in all phases of the wood preserving industry, is available from the association headquarters, 839-17th St., N.W., Washington 6, D. C. The price is $10.00 plus postage. An expanded ring binder for those whose Manual has become crowded with the addition of new standards in recent years is also available from the headquarters office at a price of $2.50.

Designed for cable pressurization systems—*

FISCHER & PORTER

AIR RATE INDICATOR

- permits a fast change in flow rate
- offers greater visibility— no parallax
- costs less



MODEL 10A1125

**Refer to Description Number AT7843X for complete specifications.*

The Fischer & Porter Air Rate Indicator is designed to continuously monitor the rate of air flow to the pressurized cable and to indicate the presence of cable sheath breaks. Approved by Bell Laboratories, it offers these outstanding advantages:

Flow Rate Interchangeability—Exclusive "snap-in" tube construction permits quick and easy change in range. Operator can switch from 0.2—2.0 scfh range to 1.0—10 scfh range, or remove tube for cleaning if necessary, in just a few seconds. No tools are required.

Wide Angle Visibility—Uncluttered view assures ease in reading; minimizes possibility of error. Operator can scan a complete bank of indicators at a glance. A Memory Pointer, which shows the operator the last recorded flow rate, is an integral part of the tube assembly and also serves to eliminate parallax.

Economy—The initial cost of the F&P Air Rate Indicator is low, and little or no maintenance is required. Spare indicating tube assemblies of either range are also economically priced.

The Model 10A1125 Indicator is now in stock ready for prompt shipment.

Get the Complete Facts! Write now for Catalog 10A1125, Fischer & Porter Company, 000 County Line Road, Hatboro, Pa. In Canada, write Fischer & Porter (Canada) Ltd., 4619 Jane Street, Downsview, Ontario.

FP FISCHER & PORTER CO. HATBORO, PA., U.S.A.

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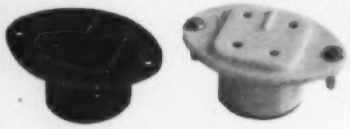

New Flush Mounting Wall Jack

In brown or ivory plastic, the SE-493A jack can be flush mounted directly in molding or wall. Four (4) spring tensioned jack holes accept standard SE283B 4 prong plug. Can be used with SE19B plate, also in ivory or brown, for attractive modern flush installation for 2, 3 or 4 wire service requirements. No conduit box necessary. SE493A $1.30 each. SE19B Plate, $.30 each. Specify brown or ivory.

NEW Outdoor Weatherproof Jack Boosts Revenues!

Subscriber demands for outdoor, backyard, or patio telephone service are growing fast. The new SE16151 Outdoor Weatherproof Jacks from SUTTLE "fill the bill" for every outdoor use. The non-corrosive, waterproof, aluminum receptacle houses the SE493A jack (above). This new jack makes an excellent extension sale-revenue booster. Another SUTTLE *quality* product at low cost. Order from SUTTLE or your distributor.

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Phone: DEarborn 2-3108

News on New Products

SPACE-MAKER TELEPHONE—The development of a new, versatile telephone, known as the space-maker has been announced by General Telephone Laboratories, subsidiary of General Telephone & Electronics.

The Laboratory announcement says the compact instrument features a moveable dial and hook-switch for complete position mobility. The dial mounting can be rotated a full 360 degrees, tilted backward 45 degrees and locked into place at any point. The handset cradle swings in a 180 degree arc and locks into any one of seven different positions. This flexibility allows the installer to mount the telephone to the subscriber's preference.

The dial and handset position are described as being easily adjusted. The installer merely removes two screws holding the base cover, loosens a lock-screw, and moves the dial and handset to the desired positions. He then re-tightens the screws and the telephone is ready for service.

A clear plastic shield inside the base is said to insure that wires and springs of the moveable hookswitch will not become tangled when the installer changes the cradle position.

A variety of mounting and wiring holes in the base of the space-maker telephone allows easy mounting on a desk, wall or any flat surface, and on an outlet box, if wiring is run in conduit, according to Automatic. By using a special L-shaped bracket, the telephone may be mounted on a horizontal surface.

Space-Maker telephones utilize standard AE Type-80 telephone components. A standard AE Type-32 ringer box, with either straight-line or harmonic ringer, may be used with the new telephone since it can be used as an extension, with or without the ringer, by connecting two wires to the mainline instrument. Assemblies are available with special wiring for use with the company's 10-A1 key system.

Chromium-plated handset hook and coiled cord are standard equipment for the instrument which is available in black and 10 colors. Request NP1211.

TELEPHONY PUBLISHING CORP.
608 S. Dearborn St.
Chicago 5, Ill.

Please have the manufacturer send me without obligation the literature indicated by the following numbers:

NP1211_____; NP1212_____; NP1213_____; NP1214_____;
NP1215_____; NP1216_____; NP1217_____; NP1218_____;
NP1219_____; NP1220_____; NP1221_____; NP1222_____.

Name.....

Company.....

Street.....

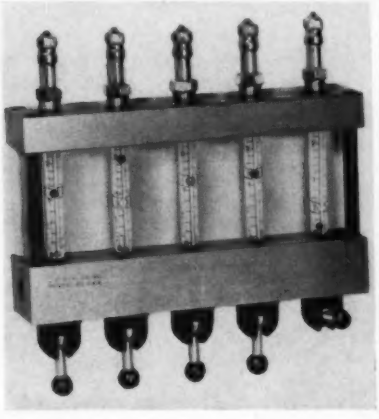
Town and State.....

11/7/59

PACKLESS AIR RATE MANIFOLD—George W. Dahl Co., Inc., announces the availability of six valves and controls specifically designed for use in the pressurization of cables in continuous flow systems. Each of the units is reported to be designed to minimize the number of fittings and connections for each cable.

The packless air rate manifold combines five flow rate indicators into a single compact unit. Separate shut-offs and pressure test valves are provided for each of the five cables serviced.

The air rate manifold, according to Dahl, has a glass float and a stainless steel float in each gauge. The lighter glass float gives readings up to 2½ scfh and the heavier stainless steel float takes over from 2½ scfh to 7 scfh. A sliding indicator is said to show at a glance any day-to-day changes in air usage by each cable, thereby signalling the occurrence of any leaks, ruptures, or stoppages in the cables.



A single air rate indicator is also available and is described as having the same operating features as the air rate manifold.

Another extremely useful valve design primarily for indoor applications is the packless toggle shut-off. This valve features straight-through flow in both the on and off positions, thereby, the company says, eliminating the need for a separate header and associated connections. The toggle is normally mounted facing the line or cable which it serves so that on or off readings are available at a glance. A variety of threaded or tubing connections are available on the toggle shut-off valve.

The dual test by-pass valve is a new innovation, announced by George W. Dahl Co., which combines both the by-pass shut-off and pressure test valves into a single unit which can be mounted directly on the cable plug. This eliminates the need for additional time and

you expect more from a specialist ...you get more from

COMPARE Alphaduct with any other telephone drop wire! None can offer you a better balance of the physical and electrical properties necessary for dependable, long-life communication service.

EXHAUSTIVE TESTING:
TANK TESTS—every coil of Alphaduct is submerged in water for voltage breakdown and insulation resistance tests.
COMPRESSION TESTS—Alphaduct drop wire is manufactured to withstand exacting crush resistance tests.
P-CLAMP TESTS—insures superior bonding of rubber to conductor and jacket to insulation...simulates field conditions.

EXCLUSIVE DATING FEATURE—every length of Alphaduct carries manufacturer's name, catalog number and date of manufacture...provides permanent service record of installation...proves Alphaduct's long-lasting durability.

CARTON PACKAGING—provides ease of handling... protects products during shipment and storage... simplifies inventory counts.

AVAILABLE IN THREE CONSTRUCTIONS (in both reinforced and non-reinforced) Twisted Pair, Parallel Type, and Dumbbell Type.

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When you buy Alphaduct Drop Wire or any one of Alphaduct's complete line of telephone wires—you buy the know-how of the only real independent specialists in the insulated telephone wire field.

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Cleveland, Ohio

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Charlottesville, Va.

effort in checking cable pressures at widely spaced test valves on either side of the plug. The dual test valve is reported to feature a stainless steel diaphragm which is not affected by the heat from soldering connections and does not have to be disassembled during installation. Several mounting brackets are available for soldering or wiring this valve to the plug.

A similar unit is the dual stem by-pass valve which performs in the same manner as the dual test by-pass valve but is designed primarily for pedestal mounting in 102-type wire terminals as used on underground cable.

The Dahl Company's packless by-pass valve is fashioned for use on cable plugs on both aerial and underground installations. It is claimed to provide a positive bubble-tight shut-off in the event of a rupture or excessive gas usage in the system. Request NP1212.

•

AIR SIGNAL MONITOR WITH INTEGRAL THREE-WAY VALVE — Also recently added to the Dahl company line of "mite" controls is the mite 74 with integral three-way valve. It is described as a precision instrument of extremely compact size for pressure limit protection. The mite 74 automatically trips on decreasing instrument air

signal either to vent or lock up downstream air. There is no bleeding of signal air before or after trip.

Trip point is adjustable from 1 to 100 psig. Repeatability ±0.25 psi. The mite 74, Dahl says, can be reset after the signal pressure is restored to approximately 10 per cent above the trip setting.

The mite 74 is equipped with a "remote pneumatic trip" connection, which is said to make possible independent tripping from a remote point or automatic tripping when an air signal exceeds a predetermined pressure. It is of rugged construction. Request NP1213.

•

COMPUTER TAPE READER—The development of a high-speed recording system that "reads" the magnetic tapes from electronic computers and instantly puts high-quality characters on microfilm has been described by Eastman Kodak Co.

The system is called Dacom for Datascope Computer Output Microfilmer. Strips of microfilm exposed by the new system were shown recently at the Office Equipment Manufacturer's Exhibit in Washington, D. C.

Dacom is said to be designed to cope with the tremendously high output of electronic computer data, an output so high that it is frequently put on magnetic tape for storage until it can be decoded.

The Kodak system "reads" magnetic tape and displays the corresponding letters or numbers on the face of a cathode-ray tube. A special camera continuously photographs the face of the "TV-like" tube to put a complete page on microfilm.

According to Kodak, Dacom has a speed of 16,500 characters per second. As many as 66 lines of 130 characters can appear as a page, and these are microfilmed at more than two frames per second. The system can record 6,900 lines or more per minute. A roll of 1,000 feet of 16mm film will contain the decoded information from more than 35 reels of 2,400-foot magnetic tape. With the new system, a great deal of information can be recorded, ready for storage, viewing, or reproduction.

The Recordak Corp., Kodak's subsidiary marketing products in the microfilming and data processing field, expects the Dacom system to have varied applications in high-speed computer read-out, and in other fields under study by Recordak's systems and product planning department.

The new system is being developed by Kodak's apparatus & optical division. After further study of market applications and technical refinements in the system, it is anticipated that Recordak will add Dacom apparatus and film to its line of microfilming products. Request NP1214.

•

1960 TRUCKSTERS — Economy of operation and compact size for use inside the plant as well as on the street,

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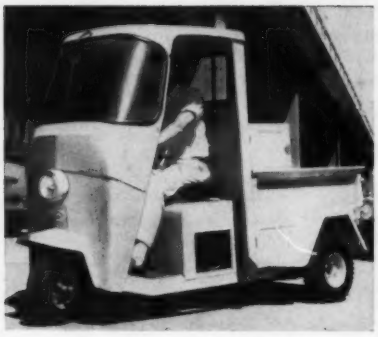
Over 600 various items of Line Construction Tools, Maintenance & Pressure-Testing Equipment in stock for immediate shipment



are said to mark the two new 1960 gasoline and electric-powered trucksters announced by Cushman Motors.

Powered by the Cushman Husky four-cycle high compression engine developing 7.95 hp, the 780 truckster (shown) is said to carry an 800-pound payload at an operating cost of less than a penny per mile. It also is claimed to make possible substantial savings on upkeep, maintenance, taxes, and insurance.

The 780 truckster is 48 inches wide. Major improvements for 1960 are reported to include a new formed channel, automotive style chassis; a longer, stronger pick-up box; a wide front shield for driver protection; top-hinged clutch and brake pedals; and a rubber mount for the engine. An optional fiber glass and steel cab is improved, the company says, with a wrap-around, full-vision windshield.

Other features include constant mesh transmission; hydraulic internal expanding brakes on all three wheels; independently operated parking brakes; heavy duty, automotive type wheel rims; and sealed beam headlight.

It is offered in two basic models—pick-up or chassis—equipped with manual (kick) or electric starter. A wide range of body accessories to fit the job are available. These are described as including: A personnel carrier; flat bed with stake racks; fiber glass cover for the pick-up body; a dump box; refrigerated box; and a "patrolster" box for police use.

The electric truckster—capable of carrying a half-ton payload plus operator and passenger and with a range of up to 50 miles on a charge—is said to be ideally suited for in-plant use and short outside hauls. Its standard equipment includes a flat bed (45⅝ inches wide by 61½ inches long) with stake racks.

Major improvements in the electric truckster for 1960 include a heavier motor and a new positive drive that is reported to take the machine, fully loaded, up steep ramps or grades. It is powered with a choice of lead-acid or Edison type batteries. A fiber glass cab is available as optional equipment.

Also new for 1960 is a personnel seat and stake rack kit with which the electric truckster can be equipped to carry a total of five passengers plus luggage or supplies.

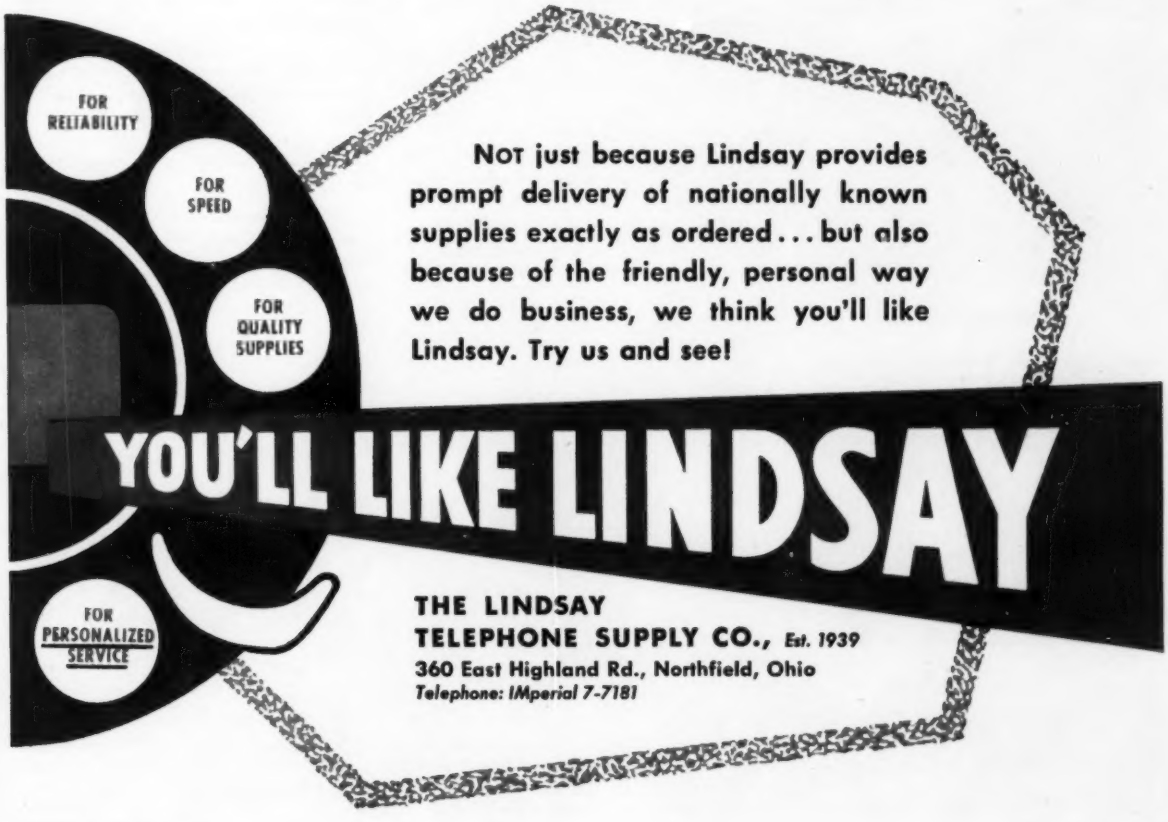
Cushman also offers two other industrial electronics. One is a one-passenger machine with a two cubic foot carrier space; the other a two-passenger machine with a quarter-ton payload rating. Both are claimed to find wide usage in plant supervision and security; mail deliveries; and the intra-plant movement of materials and supplies. Request NP1215.

•

THREE-LEGGED DERRICK — Simplification of design has enabled the Holan Corp. to lower the cost of its new Series 11000 derrick, the company said.

Boot strap linkage is claimed to make it possible to power the Series 11000 with one hydraulic cylinder. A single lever controls the derrick.

Built to handle 60-foot poles, the rugged three-legged derrick is described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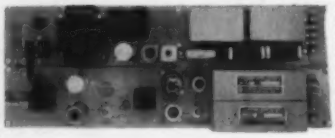

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WESTREX INC.
111 EIGHTH AVENUE, NEW YORK 11, N. Y.

BUDELMAN
ELECTRONICS
CORPORATION
371 FAIRFIELD AVE., STAMFORD, CONN.

as having maximum head height of 25 feet and lowers to within 2 feet of the ground.

The Holan Series 11000 Derrick is reported to lift 8,000 pounds and body load 2,000 pounds. When equipped with

a digger, there is no projection over the side legs when stowed overhead. Overall height in storage position is 10 feet, 2 inches.

The rectangular side legs of the Series 11000 Derrick are fabricated from high tensile steel, the company says. Request NP1216.

•

COVER REMOVAL TOOL—Designed to save time and material, a new tool has been developed by the Wiremold Co. to remove the cover of its No. 1500 or No. 2600 Pancake overfloor wiring system.

Before being made available, the tool, designated No. 656 cover removal tool, was field-tested by a telephone operating company. Complete satisfaction in the field was reported, Wiremold says. Request NP1217.

•

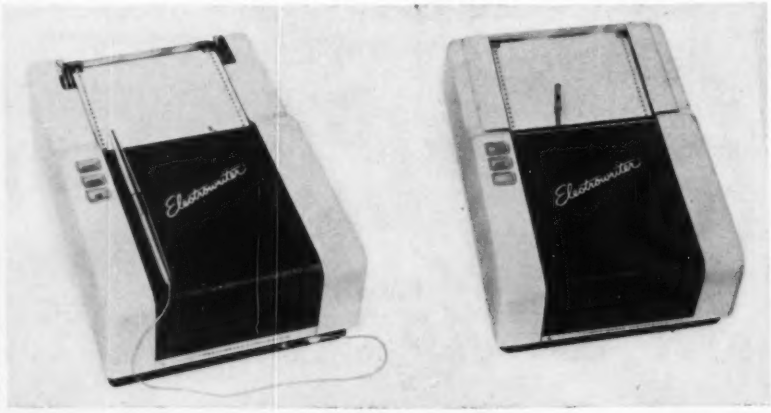
ELECTROWRITER — Comptometer Corp.'s new Electrowriter instruments, which transmit written messages or sketches over telephone circuits were demonstrated at the recent USITA convention.

A. E. Carlson, president of Comptometer, said the company's Electrowriter instruments "fill the gap" which has existed in the field of instantaneous communications. He said the user of the Electrowriter instruments writes or draws with a pen on paper as on any note pad, and as the pen moves, the remote receiver, or receivers, instantaneously and faithfully reproduce the copy as it is written.

He pointed out that any number of Electrowriter instruments, in any desired combination, any distance apart, can be inter-connected. The instruments are self-contained and are fully transistorized. No extraneous power supplies are said to be required.

"The Electrowriter instruments," Mr. Carlson said, "can be used in conjunction with existing telephone systems as well as over radio circuits. The instruments can be attached to the telephone system normally used by plants and offices and will permit both alternate written message and voice service. The messages between Electrowriter stations will pass through the switchboard in the same manner as telephone calls."

He pointed out that if a person calls a telephone extension equipped with Electrowriter "leave word" service, and no one answers his call, he can switch



At left, above, is the Electrowriter transmitter, and at right is the Electrowriter receiver, produced by the communications and electronics division of the Comptometer Corp. The Electrowriter instruments transmit written messages or sketches over telephone or radio circuits.

to "writing" and leave written notes for the called party at the unattended station.

The line of Electrowriter instruments include the following:

(1) Model 88 transmitter.
(2) Model 88 receiver.
(3) Model 88 transceiver.
(4) Model 89 transmitter.
(5) Accessories, such as winders for spooling messages, push-button selectors, dial selectors, alerting devices, telephone instruments with manual transfer key, for voice/write service and the automatic "leave word" service.

The Model 88 instruments are described as featuring a writing surface of 5 inches by 3½ inches. The units are 9½ inches wide, 14-5/16 inches long, 5 inches high at the front and 6 inches high at the back. They weigh 30 pounds, have a power consumption of 13 watts, and use a power source of 105-125 volts, 50-60 cycles. They use either roll or fan-fold paper, plain or printed.

The Model 88 transceiver is a single unit transmitter/receiver. When transmitting, the stylus is attached to the pen. Upon completion of the transmission, the equipment automatically switches to the receiving position.

The Model 89 transmitter is designed for special applications on wire or radio circuits, the company says. It is a portable transmitter which weighs 3½ pounds and is battery operated and transistorized. It is 6¼ inches wide by 9¼ inches long, with a front height of 1¼ inches and a rear height of 2½ inches. It provides a writing area of 3¾ inches by 2⅝ inches on continuous paper.

Four special demonstrations have been prepared by the company's communications and electronics division to illustrate how the Electrowriter instruments transmit written messages over telephone or radio circuits.

The demonstrations include the following:

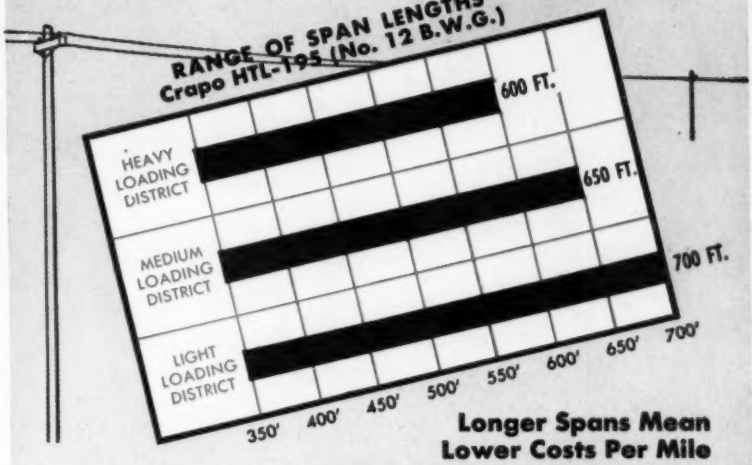
(1) A "write by telephone" demonstration. This features an Electrowriter transmitter used in conjunction with a telephone handset.
(2) A "write by radio" demonstration in which the battery-powered portable Electrowriter transmitter, Model 89, transmits a written message to an Electrowriter receiver by radio.
(3) An experimental demonstration which illustrates how Electrowriter signals can be recorded on magnetic tape for storage and subsequent play-back. While this equipment has been used in production checkout of the Electrowriter instruments, it is said to have many applications, such as signature storage and verification, storage and transmission of graphic material, etc., —all of which can be reproduced at a later date.
(4) The fourth demonstration shows

Crapo

HTL-195

FOR EXTRA LONG SPAN RURAL LINES

The NEW LOWER Resistance Extra-High Tensile Line Wire

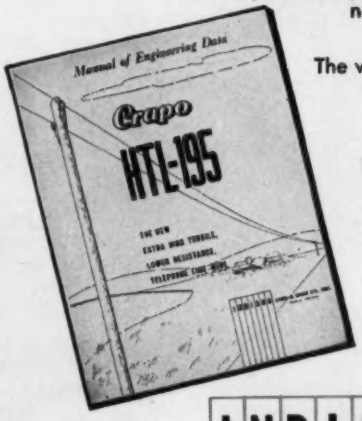


Longer Spans Mean Lower Costs Per Mile

You can cut the number of pole structures to a minimum when you use Crapo HTL-195 in building rural telephone lines. Extra long span construction, made possible by the high physical strength of this new wire, means marked savings in material and installation costs.

The voice transmission quality of Crapo HTL-195 is equal to that of Crapo HTL-135 and superior to older grades of ferrous wire.

Pertinent technical data have been prepared to assist engineers in designing and building extra long span lines with Crapo HTL-195.



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INDIANA STEEL & WIRE COMPANY, INC.
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SEAL OUT TROUBLE...

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Corrosion and oxidation are no longer maintenance problems when your ground rod connections are sealed with KEARNEY Airseal. This weather-proof compound forms an air-tight coating over any shape connection with a simple squeeze of the hand. Airseal will not deteriorate . . . even when used on ground rod connections below ground. It remains pliable indefinitely . . . at temperatures from –50°F up to 250°F.

For time-saving use KEARNEY Airseal — available in convenient sized pads, or in 10-foot rolls.

For Better Construction . . . For Safer Maintenance

Specify

263

KEARNEY PRODUCTS

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Canadian Plant: Guelph, Ontario

some of the applications which can be used in push-button and dial-selector operations with the Electrowriter instruments. The division engineers connect two Electrowriter transmitters and four Electrowriter receivers. Either of the transmitters can be connected to any combination of receivers, alternately by push-button selection or by a dial selector, to provide instant, simultaneous, written communication. Request NP1218.

•

SCALE FOR INDUSTRY—A line of automatic suspension scales, designated as Model P, has just been introduced by W. C. Dillon & Co., Inc.

These scales embody a number of advancements that make them of particular value in industrial applications, the company states. The most important feature is the accuracy of this new unit, which is calibrated with certified test weights to an accuracy of 1/10 of 1 per cent and is officially sealed by the Bureau of Weights & Measures.

The Model P has a highly legible 16 inch diameter dial. It is available in the following capacities: 0-250, 0-500, 0-750, 0-1,000, 0-2,500, 0-5,000, 0-7,500 and 0-10,000 pounds. Operation is based upon compound levers, and the mechanism is fully dampened against vibration or flutter. The safety factor is stated by Dillon as 5-1 in capacities up to and including 5,000 pounds and better than 3-1 in the 7,500 and 10,000-pound ranges.

The company states that a convenient reset or tare adjustment knob is also provided on the Model P so that the weight of slings, pallets or chains may be quickly and easily canceled out. A further refinement is claimed for the ball bearing swivel hook which revolves under a maximum load to full 360° in either direction. In addition, it will arc 27° to accommodate material pickup at an angle.

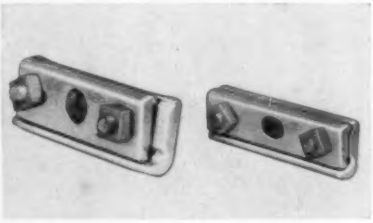
Dillon Model P scales have a net weight of 56 pounds and thus can be carried by the operator to various plant locations.

Being temperature-compensated, they are described as unaffected by the extremes of foundry room heat or the sub-zero of outside storage yards.

In addition to hoist or crane applications, they may also be utilized with fork lift trucks by being suspended from a cross-bar on the fork. Request NP1219.

•

STANDARD AERIAL CABLE CLAMPS—Recently added to the line of MIF aerial cable hardware produced by Malleable Iron Fittings Co., pole hardware division, are standard type cable suspension clamps.



These clamps are said to offer the most generously belled grooves of any similar clamps on the market, for maximum protection to cable messengers, without additional cost.

Two types are listed. Both are supplied with ½-inch diameter track bolts and are designed for mounting with machine or double arming bolts which also serve as a third clamping bolt.

For added clearance from the pole, the company says additional nuts or washers can be used. Clamping plates are tough, malleable iron, hot dip galvanized for added protection against corrosion. Request NP1220.

•

"POWER VOICE" SPEAKER—Motorola has introduced a 15-watt speaker for use with its Motrac two-way radio line. Fully transistorized, the new "Power Voice" speaker is reported to triple normal speaker audio output enabling users to hear radio messages even when hundreds of feet from their vehicles.

As an additional feature, the new speaker, according to Motorola, is equipped with an 8-foot coil cord and special mounting brackets which provide temporary mounting of the speaker on the outside of the vehicle window.

The Motrac radio is said to be the first unit to be available with a fully transistorized receiver and power sup-

For sure
telephone cable support use

CF&I Galvanized Steel Strand

The Image of CF&I—a giant steelman—stands for continually improved steel products for all industries. One of these dependable products is CF&I Galvanized Steel Strand which provides years of trouble-free support for aerial cables.

Strong yet flexible, CF&I Strand is easy to install. An "envelope" of zinc acts like a raincoat on this messenger, protecting it against corrosion.

Also used for guying, CF&I Galvanized Steel Strand made in seven- and three-wire constructions meets ASTM Specification A-122. Or it can be made to your individual specifications. For prompt delivery, call the nearby CF&I sales office or contact your local distributor.

6772-A

CF&I STEEL

GALVANIZED STEEL STRAND
THE COLORADO FUEL AND IRON CORPORATION

In the West: **THE COLORADO FUEL AND IRON CORPORATION**—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Farmington (N. M.) • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita
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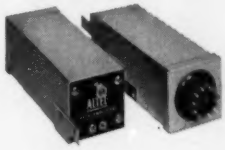
ALTEC TELEPHONE EQUIPMENT

Compact · Versatile · Easy to Service

The advanced design of ALTEC telephone equipment makes it ideal for modern telephone systems. In addition to its reliability and high standard of performance, ALTEC equipment requires a minimum amount of space. Inherent flexibility makes it useful in a wide range of applications. Easy maintenance is designed in to save time and money in servicing.



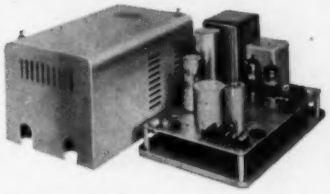
447A TRANSISTOR AMPLIFIER
Telephone Repeater Type

Directly interchangeable with vacuum tube repeaters; dimensions are identical. Requires only 24 - 48 volts. Eliminates need for 130v supply.

SPECIFICATIONS:
Type: Repeater Amplifier (transistorized) • Gain: 37 db from and into 600 ohm loads • Power Output: +18 dbm (at +10 dbm distortion is 1.5%, 300-3000 cps) • Frequency Response: −1 db at 200 and 5000 cps referred to 1000 cps • Input Impedance: 600 ohms • Output Impedance: 600 ohms • Output Noise Level: −70 dbm • Controls: Input volume control which varies gain from −2 db to maximum gain • Power Required: 17 - 24 v (50 ma @ 20 volts) • Transistors: 1 — 2N191, 1 — 2N188A • Dimensions: 1¾" x 1¾" x 6" • Color: Cadmium plate with dichromate finish • Weight: 14 oz. • Mounting: 11 pin Amphenol 86 CPN plug • Monitor Tap: Auxiliary output winding 11 db below 600 ohm winding available at test jacks on front panel and at connector pins at rear of unit • Accessories: Panel for rack mounting 10 repeaters; Rack mounting power supply capable of energizing 100 repeaters; Equalizer; Panel for mounting up to 10 equalizers; Assembly for mounting a 447A in 105B apparatus box.

444B AMPLIFIER
COMPRESSION TYPE

Compression, attack and recovery times are fixed quantities providing optimum performance for message use.



SPECIFICATIONS:
Type: Compressor Amplifier • Gain: 600 ohm input: 70 db • Bridging input: 57 db bridging 600 ohm line • Maximum Compression: 35 db change in input results in 15 db change in output • Power Output: 34 dbm at 30 db compression; 35 dbm with rectifier tube removed • Frequency Response: −2 db at 100 and 3000 cps relative to 1000 cps; More than 10 db down at 10,000 cps • Input Impedance: 600 ohms balanced and 12,000 ohms balanced for bridging • Source Impedance: 600 ohms • Load Impedance: 4 and 600 ohms • Noise Level: 80 db below rated output; −115 dbm equivalent input noise • Power Supply: 117 volts, 60 cps, 30 watts • Tubes: 1 — 6BC8, 1 — 6AL5, 2 — 12BY7A • Dimensions: 9" x 6" x 5" • Weight: 7½ lbs. • Attack Time: 50 milliseconds • Recovery Time: 1 second for 63% recovery • Harmonic Distortion: At 33 dbm output, less than 5%, 200 - 4000 cps; At 30 dbm output, less than 2%, 200 - 4000 cps.

S-17B PROGRAM
AMPLIFIER SYSTEM

Cabinet houses two program-quality 437B amplifiers capable of multiple tandem operation, two 17224 equalizers, and two jack fields to facilitate testing, equalizing, and monitoring. Each amplifier contains its own AC power supply and mounts in the cabinet independently on a plug-in basis for easy replacement and centralized maintenance.

SPECIFICATIONS:
Output Power: +24 dbm • Distortion: not over ½% THD (30 - 15,000 CPS at +24 dbm) • Gain: at least 44 db; adjustable to minimum of 8 db • Gain adjustment: 2 db steps and 1½ db vernier • Frequency response: ±1 db, 20 - 20,000 cps • Equiv. input noise: −115 dbm • Input impedance (internal): 150/600 ohms ±5% • Output impedance (internal): 150/600 ohms ±5% as measured at output of the bridge • Longitudinal balance of input circuit and output circuit with 600 ohm connection: 55 to 60 db at 40 and 15,000 cps; 70 db at 1000 cps • Tubes: 1 — 12AY7, 2 — 12BY7A • Electrolytic condensers: Sprague 17D or equivalent • Transformer insulation: 1500 volt insulation between primary and secondary windings • Impendance change simply accomplished by reversing the impedance plug. Occupies 9⅜" of 19" rack space.

For complete information about ALTEC telephone and paging equipment write to address below or call PRospect 4-2900.

Famous for Quality and Dependability

ALTEC LANSING CORPORATION

ALTEC LANSING CORPORATION
1515 S. Manchester Ave., Anaheim, Calif.
A subsidiary of Ling-Electronics, Inc.

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Stops

Leakage and Corrosion

The safe low 150°F surface temperature ...®

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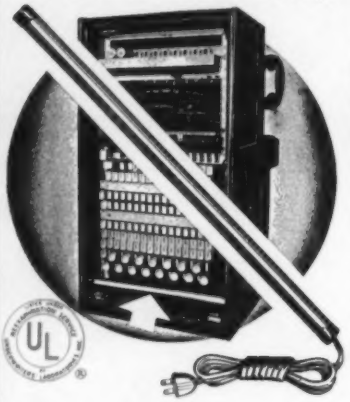
DEHUMIDIFYING HEATER



- For all PBX
- Unattended CDO's
- Central Office Equipment

Maintenance free. The lifetime heating element is sealed in a 3/4" aluminum tube. Inexpensive, standard, 1-1½-2 & 3 foot lengths for equipment wide efficient heat distribution. Safe to place anywhere! Half the operating cost of old fashoned, inefficient, dangerous "hot spot resistor heaters."

NO Chemicals Replacements Worry

NO Fire Hazard Personnel Hazard Equipment Damage

No assembly, comes complete with clips. Simply plug in and forget, never needs attention. Immediate delivery! Field tested and proved by one of the South's largest telephone companies.

5 YEAR WRITTEN GUARANTEE

Phone: OX. 3-8271 or write for prices and full particulars.

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DAMPP-CHASER, INC.

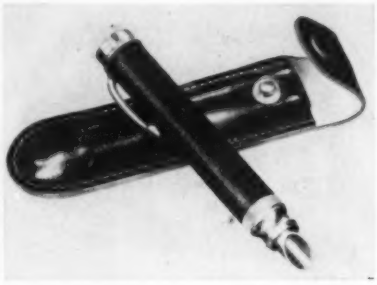
HENDERSONVILLE, NORTH CAROLINA

Affiliate: DAMPP-CHASER, LTD. London, England

ply. Its own speaker provides five watts audio output which is the highest available from a standard speaker. Although this is normally adequate, the extra performance of the supplemental "power voice" speaker is beneficial when a user is far from the vehicle or working in noisy locations. Request NP1221.

•

FIFTY-POWER POCKET MICROSCOPE—A handy pocket microscope reported to be precision-made of finest optical steel, is available from Leslie Creations. It magnifies 50 times.



The objective end is described as having a curved metal guard which reflects any light source (lamp, daylight, flashlight) to provide brilliant illumination and a vivid image of the object being examined. Only 3½ inches long, it has an adjustable lens for fine focusing.

This microscope has a black crinkle-finish barrel, with chrome parts. Included are a pocket clip and pigskin case with snap fastener. Leslie recommends it as a very practical business gift. Request NP1222.

Aldington, Head of Siemens, G.B., Tours Canada

Dr. J. N. Aldington, managing director of Siemens Edison Swan Ltd. and a director of Associated Electrical Industries, Ltd., London, England, was scheduled to leave for a tour of Canada to arrive back in Great Britain on Nov. 2.

This is one of a series of personal visits which he is making to Siemens Edison Swan Overseas Group operations, and follows similar visits to South Africa, Australia and New Zealand during the last twelve months.

It is anticipated that these visits will be repeated periodically over the next few years, to keep in personal touch with overseas agents and customers.

The spread of the present Canadian tour will be from coast to coast and, accompanied by H. T. Wormell (president of Siemens Edison Swan (Canada) Ltd.), from Vancouver right across the continent, finishing in Toronto and Montreal.

Principal visits include the Siemens Edison Swan Canadian offices, and also Winnipeg, where large engineering and telecommunication assembly work is carried out.

Dr. Aldington will, in addition, be meeting overseas customers of Submarine Cables Ltd. This company, of which he is also chairman, is owned jointly by Siemens Edison Swan Ltd., and The Telegraph Construction & Maintenance Co.

Anaconda Wire & Cable Co. Elects Steinmetz President

Richard B. Steinmetz on Oct. 21 was elected president of the Anaconda Wire & Cable Co., a subsidiary of The Anaconda Co.

Mr. Steinmetz has been associated with the Anaconda organization since 1929, and has been executive vice president since 1957. He succeeds William E. Sprackling who is now retiring. Mr. Sprackling will remain as a director of the subsidiary.

Anaconda Wire & Cable also announced that William H. Benton, general manager of mills, has been elected to the board of directors.

EXTRA Holding Power
QUICKLY Installed
TOUGH For long life

EVERSTICK ANCHORS

For new construction and maintenance — Everstick Anchors speed up work and provide dependable anchorage on all types of jobs. Made of resiliant, rust resistant malleable iron. The toughest anchors made. Write for bulletin.

EVERSTICK ANCHOR CO.
FAIRFIELD, IOWA

R. B. STEINMETZ

A native of Washington, D. C., Mr. Steinmetz is an electrical engineering graduate of Cornell, class of 1922.

His early years with the company were spent in electrical engineering assignments and as a district sales engineer in several major cities. Throughout the war, he was a special Washington, D. C. representative of the company handling army and navy wire requirements.

In 1946 he became sales manager for the Marion, Ind., mill, and in 1948 was named its manager.

In succeeding advancements, Mr. Steinmetz became general manager of all mills in 1951; and vice president in charge of manufacturing operations in 1952, the post he held until named executive vice president in 1957.

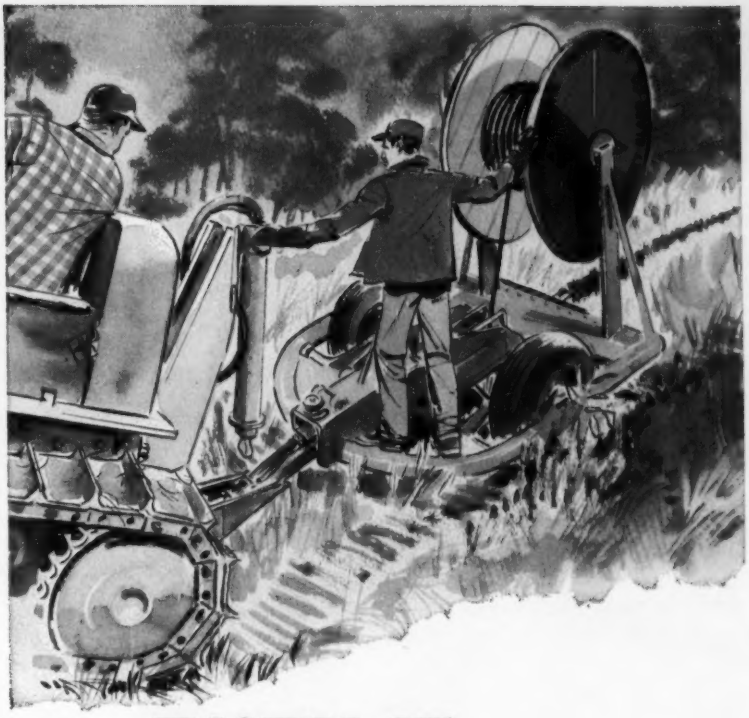
He served in the Marine Corps in World War I.

The Anaconda Wire & Cable Co. mills are located in the following cities: Anderson, Ind.; Great Falls, Mont.; Hastings-on-Hudson, N. Y.; Marion, Ind.; Muskegon, Mich.; Orange, Calif.; Redwood City, Calif.; Sycamore, Ill.; and in Watkinsville, Ga.

White Motors Names Ball Advertising-Promotion Head

The appointment of Bernard C. Ball as advertising and sales promotion manager for the White Diesel Engine Division, The White Motor Co., Springfield, O., has been announced by William F. Burrows, vice president and general manager. Mr. Ball assumed his duties Sept. 1.

He received his bachelor of arts degree from Marshall College, Huntington, W. Va., and his master's degree from Ohio State University. He has



BURY IT
FORGET IT

Whitney Blake TELECABLE for Direct Burial, is made to last, to withstand the most "unfriendly" soil conditions and to give long, uninterrupted service underground.

It is quality that makes for true economy . . . that's why we can say "bury it and forget it."

WB TELECABLE — Type DB
Complies with REA
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Telephone CHestnut 8-5515
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NEW HAVEN 14, CONNECTICUT

B. C. BALL

been active in advertising and advertising agency work since 1946.

The White Diesel Engine Division of the White Motor Co. manufactures diesel, gas, and dual-fuel engines used throughout the world for stationary, marine, and oil field applications. Sales and service branches serve the United States, Canada, Alaska, and foreign countries.

Recent Quotations of Independent Telephone Stocks

	10/30/59 BID	10/30/59 ASKED	10/1/59 BID	10/1/59 ASKED
Anglo-Canadian Telephone Co.	37	37¾	33	33¾
California Interstate Telephone Co.	14½	15	14¾	15¼
California Pacific Utilities Co.	35⅞	36¼	34¼	34¾
California Water & Telephone Co.	26	26½	25⅝	26
Carolina Telephone & Telegraph Co.	172	175	168	Bid
Central Telephone Co.	27½	28	26¾	27½
Chenango & Unadilla Telephone Corp.	27	27½	27	Bid
Cincinnati & Suburban Bell Telephone Co.	90½	91	91½	92½
Citizens Utilities	12¾	13⅛	13	13⅜
Commonwealth Telephone Co.	18¼	19	18¾	Bid
Florida Telephone Corp. Class A	28½	29¼	29¾	30½
General Telephone Corp. Common	71¾	Last Sale	69⅜	Last Sale
Hawaiian Telephone Co.	20	21½	21	22
Indiana Telephone Corp.	19	21	19	21
Inter-County Telephone & Telegraph Co.	55½	58½	54	57
Inter-Mountain Telephone Co.	15⅝	16⅛	15½	16
Lincoln Telephone & Telegraph Co.	60	Bid	59	Bid
Middle States Telephone Co. of Illinois	23	24	22¼	23¼
North Carolina Telephone Co.	1½	1⅝	1⅜	1½
Northern Ohio Telephone Co.	45	47	44	46
Peoples Telephone Co.	90	Bid	95	Bid
Rochester Telephone Corp.	26	Last Sale	26	Last Sale
Southern Nevada Telephone Co.	21	22	21	22
Southern New England Telephone Co.	43⅜	43⅞	43	43½
Southwestern States Telephone Co.	23¼	23¾	24¼	24¾
Telephone Service Co. of Ohio Class A	118	122	115	122
Tidewater Telephone Co.	24	26½	25	27
United Utilities, Inc.	38¼	39	30	30½
West Coast Telephone Co.	24¼	24⅝	24¾	25¼
Western Light & Telephone Co., Inc.	39	39¾	39½	40½

(Quotations supplied by Merrill Lynch, Pierce, Fenner & Smith)

PRECISE TENSIONING

of conductor, messenger, or guy wires, etc., with

Dillon Dynamometers

Why put up with "Oscillation" and "Sight and Sag" methods of setting tension when it is possible to employ a means of *precise* tensioning that is *not* subject to human error? The Dillon Dynamometer is the answer to this need!

Above photo illustrates ease with which the Dillon Dynamometer accurately checks tension in a new line going up or in an old line standing *without cutting the wire*. We will be happy to supply illustrated details upon request.

Available in 13 capacities from 0-500 to 0-100,000 lbs., Dillon Dynamometers also check effective holding strength of anchors, strength of insulators and cross arms, weight of cable reels and poles and perform scores of other important tests. Compact, light and sturdy, all Dillon Dynamometers are overload protected, equipped with max. hand, and certified accurate.

W. C. Dillon & COMPANY, INC.

14586 KESWICK ST.
VAN NUYS 14, CALIF.

Simplify your research and design problems—with

CIRCUIT THEORY and DESIGN

By John L. Stewart, *California Institute of Technology*. Stressing modern, powerful pole-zero design methods, this book applies modern network theory to the understanding of vacuum tubes and feedback systems.

The author avoids use of abstract mathematics, yet gives data and design procedures of practical significance, discussing a wide variety of specific devices. The pole-zero design methods, given in easy-to-use form, show development of design for a large variety of circuits with and without vacuum tubes, and for systems with and without feedback. This book is a *must* for anyone interested in design and research in linear systems. **1956. 480 pages. 463 illus. $9.50.**

For sale by:

TELEPHONY 608 S. Dearborn St., Chicago 5, Ill.

Stromberg Names Palmer Vice President

The appointment of Richard C. Palmer as a vice president of the Stromberg-Carlson division of General Dynamics Corp. was announced by Robert C. Tait, president.

Mr. Palmer will manage Stromberg-Carlson's office in Washington, D. C., succeeding Andrew H. Bergeson in this position. Mr. Bergeson has resigned to join a group of executives in forming a small business investment company which will operate under the Small Business Investment Act of 1958 to provide capital and management services to companies in the electronics and avionics fields.

In addition to his Washington responsibilities, Mr. Palmer will assist Stromberg-Carlson management in Rochester in the coordination of company-wide government relations programs and military marketing. He goes to Stromberg-Carlson from the Fairchild Engine & Airplane Corp., with which he had been associated since 1945, first as assistant to the president, and later as vice president—communications.

A native of Cleveland, O., Mr. Palmer is a graduate of Denison University. While attending the university, he also worked as a reporter for the Cleveland *News*. He studied law at the University of Denver, receiving his law degree "cum laude" in 1929. He was admitted to the Colorado bar that same year, and then spent another year in further law studies at the University of Oxford, England.

Upon his return to this country, he became a member of the Lewis & Bond law firm in Denver, and continued in that affiliation until 1936. From 1932 to 1936, he also served as secretary to Colorado Rep. Lawrence Lewis.

In 1936, Mr. Palmer joined the legal staff of the general counsel of the Bureau of Internal Revenue, and served there until 1939, when he became secretary to Sen. Alva B. Adams. The following year, he also served as secretary to Sen. Eugene D. Millikin.

Mr. Palmer became assistant director of the National Aircraft War Production Council in 1943, and was made general manager of the council the following year.

He is a past president and immediate past chairman of the board of trustees of the National Security Industrial Association, in which he continues to serve as a trustee. Mr. Palmer's affiliations include the American Ordnance Association, National Aviation Club, National Press Club, and the Aero Club.

Seasonal photo (above) appearing on TELEPHONY cover of March 8, 1958 shows how Sally Ann Joy got to her operator's post last year, even in mid-winter, on her Tennessee walking horse. Having earned a reputation for reliability, she has, at 19, become chief operator of the Au Sable Valley Telephone Co., Keeseville, N. Y. In the company's greatly enlarged toll center now being planned, she should take in stride the increased responsibilities which will be hers, says George S. Beckwith, manager.

TAKE A BIG STEP TOWARD **SAFETY** WITH **DUO-SAFETY LADDERS**

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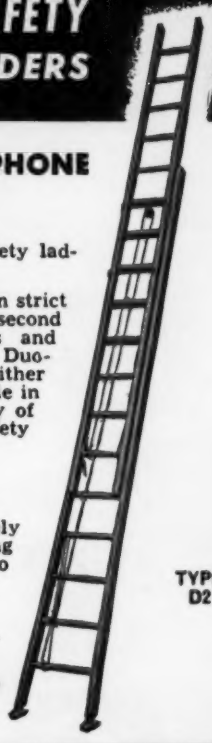

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IN THE NATION'S CAPITAL

Continued from page 18

be placed on the Western Union facsimile drum which, at the push of a button, will begin revolving at 180 revolutions per minute. As the drum revolves, an "electric eye" will scan the material at 1.8 vertical inches a minute. The copy will be received at the destination city immediately as an exact facsimile of the original.

American business firms now are using over 36,000 Western Union Desk-Fax facsimile machines for the local pick-up and delivery of 40 million telegrams annually between their offices and central telegraph offices. In addition, the company leases 324 separate Intrafax facsimile systems which are used by the government and a wide variety of businesses to speed their intracompany communications over short and long distances. The new facsimile service will go further than present uses because any customer in one of the five cities will be able to give material to the telegraph company for transmission and delivery in facsimile form. The offering of the new service is designed to determine the extent of present demand for this type of facsimile service. Extensive experience has been gained by Western Union since previous experiments with public facsimile service when equipment and facilities were in early development stages.

IT&T's Facsimile

Bearing a New York City dateline of Oct. 27, a spokesman for the International Telephone & Telegraph Corp. said that his company was working on a mail facsimile transmission system which might eventually be able to send up to 1,800 pages of written matter a minute across the country. The spokesman said that since signing a contract with the post office last July, IT&T had set up experimental facsimile equipment in Washington, D. C., and Los Angeles.

The spokesman added that the facsimile system, which is now undergoing a test, is slow, in that it takes about four minutes to send an 8½ by 11-inch page. But he said IT&T's engineers feel they can ultimately develop an 1,800-page-a-minute machine. He continued that while facsimile itself is not new, high-speed facsimile is new.

The IT&T official claims that one of the great challenges in the new system will be to preserve the sanctity of the mail. He stated that the firm's engineers are testing an electronic eye that would read through an envelope, and at the other end would reproduce the message in an envelope already sealed. There would be a window in the envelope, and the writer of a letter would put the name of the addressee and his own name in a space in this window. All that anyone in the post office would see would be who the letter is for, and by whom it was sent. The spokesman said the experiment has barely got started, inasmuch as the contract was signed only a few months ago.

REA Developments

The head of an Agriculture Department advisory committee predicts that the need for rural telephone loan money will double in the next fiscal year. In the present fiscal year, the Rural Electrification Administration has authority to approve 104 million dollars in telephone loans. However, Harold L. Ericson, of Hector, Minn., head of the Minnesota Central Telephone Co. and advisory committee chairman, said 200 million dollars will be needed in the next fiscal year beginning July 1, 1960.

REA Administrator David A. Hamil agreed that the need for loans would go up next year, but he said he thought Ericson's estimate was too high. Ericson reported that the advisory committee also discussed administration proposals to raise interest rates on REA loans. A formal report is expected later.

On Oct. 26, the REA celebrated the 10th anniversary of the establishment of the REA telephone loan program. Due to illness, Secretary of Agriculture Benson was unable to deliver his remarks commemorating the telephone amendment to the REA act. Under Secretary Morse, however, welcomed the various guests and manufacturers who exhibited REA-approved equipment. The 10th anniversary celebration co-

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Answers to Questions On Page 35

(1) Ask, "what operator number, please?"

(2) Yes.

(3) Enter "cov by WH" on back of original ticket and scratch it.

(4) The operator will locate the original ticket and give the desired information to the calling operator.

(5) The operator will say "no record" to the calling operator.

incides with the Washington meeting of the Telephone Advisory Committee to REA. The council is a group of Independent and cooperative telephone company representatives who act in an advisory capacity to REA.

Under Secretary Morse, speaking on behalf of Secretary Benson, stated that the enactment of the telephone amendment had opened a "new era of rural communications." He noted that 10 years ago only 38 per cent of the rural areas in the nation had telephone service and the majority of this service was of the hand-cranked variety. Today 60 per cent, or 900,000 rural residents, have telephone service and 85 per cent of these subscribers have dial phones. The majority of the advances made in rural telephone service, it was pointed out, have come about because of the enactment of the telephone amendment to the REA act. To date 469 Independent telephone companies and 210 cooperatives have availed themselves of REA loans.

The 17-man telephone advisory committee to REA is composed of the following: Roy C. Boecher, Pioneer Telephone Cooperative, Inc.; James A. Cobb, Heins Telephone Co.; Donald Dickson, Project Mutual Telephone Cooperative Association, Inc.; Harold C. Ebaugh, Triangle Telephone Association, Inc.; Harold L. Ericson, Minnesota Central Telephone Co.; Clyde E. Eskridge, Mid Century Cooperative Telephone Association; Fred R. Harris, Southern Telephone Co.

Also: W. C. Henry, Northern Ohio Telephone Co.; Edward D. Hildreth, DeKalb Telephone Cooperative; J. P. Maguire, Central California Telephone Co.; D. J. McKay, The Golden Belt Telephone Association, Inc.; Orla L. Moody, American Telephone & Telegraph Co.; Downing Musgrove, Homer-

Ohio Governor Di Salle, on a recent visit to Tuscan brothers' restaurant in Galion, was impressed by the Ericofon used there. The Tuscans invited North Electric to present its instrument to Di Salle. Shown in the governor's office, left to right: Joe Tuscan; H. C. Ryon, North vice president; and the governor.

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ville Telephone Co., Inc.; H. G. Payne, Murraysville Telephone Co.; Joe Roberts, Inter-County Telephone Co.; Riggs Shepperd, Southwest Texas Telephone Cooperative, Inc., and W. G. Winters, Texas Telephone & Telegraph Co.

New Independent Assignment

A small Independent, Piedmont Telephone Co., has won the right to serve Washington's new jet airport at Chantilly, Va. The company already is working on plans to handle the job of expanding its facilities. Piedmont's franchise gives it the telephone business for the administration building, terminal, control tower, and most operating facilities at the airport. The airport, to be known as Dulles International Airport, will be ready in 1961 and is necessary because the present National Airport is too congested and small in area for jet service.

Chesapeake & Potomac Telephone Co. of Virginia has the franchise covering the Chantilly airport area where the runways and a few auxiliary buildings will be located. Stanley A. Owens, manager and principal stockholder of Piedmont, expects the company's present 1,200 telephone customers will grow to 15,000 to 20,000 in the next decade because of the airport.

C. H. Fruh Named Planning Engineer, GT&E Laboratories

Carl H. Fruh has been named planning engineer for General Telephone Laboratories, Northlake, Ill. He succeeds Donald E. Klang who has been appointed director of product development for General Telephone & Electronics in New York.

Mr. Fruh will be responsible for assisting in the administration of laboratories operations and procedures.

C. H. FRUH

Fruh joined the subsidiary of General Telephone & Electronics in 1955 as a process engineer. Prior to his new assignment, he was serving as a staff engineer for Automatic Electric's technical services department.

He is a graduate of Illinois Institute of Technology with a B.S. degree in Industrial Engineering, and did graduate work at IIT's evening school for four years.

Strufe Named Bartlett Tree Atlanta Representative

Fred W. Strufe has been appointed Atlanta representative for the Bartlett Tree Experts, it was announced on Oct. 12.

A tree specialist for 32 years, Mr. Strufe will direct the company's maintenance and care of shade trees as well as control of woody plants along utility rights-of-way for the Southeast out of Atlanta.

F. W. STRUFE

For the past 13 years, Mr. Strufe has been identified with tree care in Georgia and the Southeast. A graduate tree surgeon, he has specialized in the newest scientific advancements in shade tree care. Bartlett states he also is a recognized technician in year-round chemical spraying for brush control.

Install Microwave System For California Company

The Siskiyou Telephone Co., Etna, Cal., has announced that it is installing an 80-mile microwave communications system, a seven-hop network furnishing service between Happy Camp, Hamburg, Etna, Yreka and Fort Jones.

In charge of the installation is the Philco Corp.'s Government & Industrial Division. The new system is replacing pole lines over Cade and Forrest mountains, the company stated.

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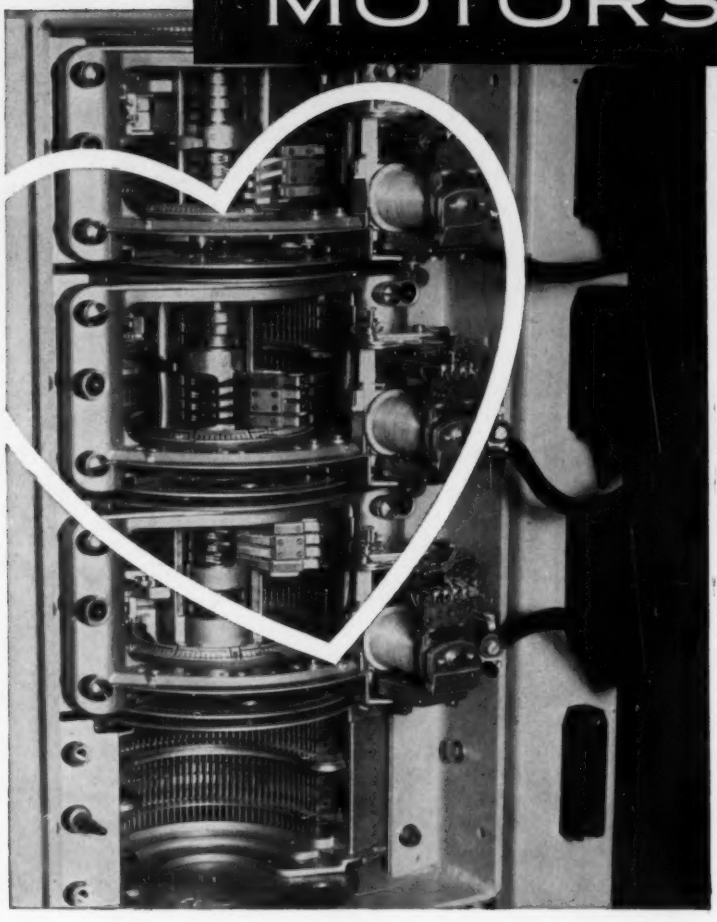

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